From:	Sadie Wright - NOAA Federal <sadie.wright@noaa.gov>
Sent time:	02/24/2014 11:33:36 AM
To:	Meade, Chris
Subject:	Juneau Access Road BA
Attachments:	JAI Final BA 01-29-14.pdf

Hi Chris,

Here is the BA I received from the FWHA for the Juneau Access Road project.

Cheers,
Sadie

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Revised Biological Assessment

Prepared by:

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& Public Facilities
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Acronyms and Abbreviations

ACF	Alaska Class Ferry
ADEC	Alaska Department of Environmental Conservation
ADF&G	Alaska Department of Fish and Game
AMHS	Alaska Marine Highway System
ATV	all-terrain vehicle
BA	Biological Assessment
BO	Biological Opinion
dB	decibels
dBA	A-weighted decibels
DEIS	Draft Environmental Impact Statement
DOT&PF	Alaska Department of Transportation and Public Facilities
DPS	Distinct Population Segment
eDPS	eastern Distinct Population Segment
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
ESA	Endangered Species Act
FHWA	Federal Highway Administration
ips	inches per second
ITS	Incidental Take Statement
JAI	Juneau Access Improvements
LOA	Letter of Authorization
LOC	Letter of Concurrence
MMPA	Marine Mammal Protection Act
NMFS	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
PCE	primary constituent element
RMS	Root Mean Square
ROD	Record of Decision
SEIS	Supplementary Environmental Impact Statement
SSL	Steller sea lion
TL	transmission loss
TNM®	Traffic Noise Model
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
wDPS	western Distinct Population Segment
ZOI	Zone of Influence

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1. Introduction

The Alaska Department of Transportation and Public Facilities (DOT&PF) is preparing a Supplemental Environmental Impact Statement (SEIS) for the Juneau Access Improvements (JAI) Project on behalf of the Federal Highway Administration (FHWA). The National Marine Fisheries Service (NMFS) lists two species within the project area as threatened or endangered and designated critical habitat under the Endangered Species Act (ESA) of 1973:

- North Pacific humpback whales, *Megaptera novaeangliae*, (endangered)
- Western Distinct Population Segment (wDPS) of Steller sea lions (SSLs), *Eumetopias jubatus*, (endangered)

Gran Point, on the east side of Lynn Canal south of the Katzehin River, is designated as critical habitat for SSLs. No critical habitat has been designated for humpback whales.

On December 4, 2013, the eastern DPS (eDPS) of SSLs was removed from the list of List of Endangered and Threatened species. However, all three species are protected under the Marine Mammal Protection Act (MMPA) of 1972.

1.1 Background

In 2006, the FHWA issued a Record of Decision (ROD) on the JAI Project. In the ROD, the FHWA selected Alternative 2B, East Lynn Canal Highway and Katzehin Ferry Terminal, as the preferred alternative to provide improved transportation between Juneau and Haines, Alaska. Prior to issuance of the ROD, the NMFS concurred with the FHWA's *not likely to adversely affect* determinations for species listed under the ESA, as presented in the 2005 Revised Biological Assessment (BA) prepared for the project (FHWA 2005). The revised BA and subsequent 2005 NMFS Letter of Concurrence (LOC) stated that, with impact minimization measures, the preferred alternative would not adversely affect the eastern or western DPS of SSLs, SSL critical habitat, or humpback whales (*Megaptera novaeangliae*). Section 7 contains a list of 2005 minimization measures, the current proposed measures, and the basis for any changes currently proposed to those measures.

A subsequent legal challenge and District Court ruling stated that the FEIS was invalid because it did not include an alternative that would improve transportation in Lynn Canal with existing assets. This decision was later upheld in the 2011 Court of Appeals. The new alternative (Alternative 1B) is defined and analyzed in the 2014 JAI Project SEIS prepared by the Alaska DOT&PF on behalf of the FHWA; however, it is not the preferred alternative. For this reason, FHWA is not requesting consultation on Alternative 1B, and it will not be discussed further in this revised BA.

The East Lynn Canal Highway to Katzehin with Shuttles to Haines and Skagway (Alternative 2B), is the subject of this ESA consultation and revised BA. Elements of Alternative 2B were previously the subject of two informal ESA consultations (see Section 2), the most recent of which was completed in September 2005.

1.2 Purpose

The ESA of 1973, amended in 1988, requires that federal agencies ensure that any action they authorize, fund, or carry out does not jeopardize the continued existence of any endangered or threatened species, and does not adversely modify designated critical habitat of such species. When a federal action agency authorizes, funds, or carries out an action, it must consult with the National Marine Fisheries Service (NMFS) and/or the U.S. Fish and Wildlife Service (USFWS) if the agency determines that the action may affect ESA-listed species. For the actions described in this revised Biological Assessment (BA), the action agencies are the FHWA as the lead federal agency; the U.S. Army Corps of Engineers (USACE), a federal authorizing agency for all activities taking place in Waters of the U.S., pursuant to regulations under Section 404 of the Clean Water Act and a cooperating agency for the JAI SEIS; and the U.S. Forest Service (USFS), which is a cooperating agency for the JAI SEIS. Both USACE and USFS have formally agreed to allow FHWA to assume the lead responsibility role for any required Section 7 consultations. As such, the FHWA, on behalf of itself and the USACE and USFS, is submitting this revised BA to request formal consultation with the NMFS for the western Distinct Population Segment (wDPS) of Steller sea lion (SSLs) (*Eumetopias jubatus*) and designated critical habitat at Gran Point, and to request concurrence for the determination that Alternative 2B *may affect*, but *is not likely to adversely affect* humpback whales (*Megaptera novaeangliae*).

This document incorporates by reference previous consultation documents including the 1998 and 2005 Revised BAs. New project actions not previously considered are presented herein and project actions that were previously considered and are still applicable to the current preferred alternative are summarized.

1.3 Regulatory Update

The NMFS Protected Resources Division is responsible for the management of the SSL under the ESA and Marine Mammal Protection Act (MMPA). In 1990, NMFS originally listed the SSL under the ESA in response to a decline in populations throughout its range (55 FR 29792). Critical habitat was designated in 1994 (59 FR 30715). In 1997, NMFS re-characterized the western and eastern populations of SSL in Alaska as two DPSs (western and eastern), based on demographic and genetic differences (62 FR 30772). The two populations (western and eastern) of SSL are separated geographically by the dividing line near Cape Suckling, approximately 50 miles southeast of Cordova, Alaska. The wDPS is listed as "endangered" under the ESA.

The eDPS, previously listed as "threatened," was removed from the list of Endangered and Threatened Species on December 4, 2013. In a Status Review of the eDPS completed in October 2013, NMFS concluded that the recovery criteria set forth in the Recovery Plan for this DPS have been met, and that the eDPS should be delisted (NMFS 2013). The Final Rule to delist the eDPS was published in the *Federal Register* on November 4, 2013 (78FR 66140). The delisting was final on December 4, 2013. Based on the removal of the eDPS of SSLs from the list of endangered and threatened species under the ESA, this revised BA does not address impacts to the eDPS or request ESA Section 7 consultation for the eDPS population.

2. Consultation History

The JAI Project has been in development for nearly 20 years. Over that time, NMFS has twice concurred that, with appropriate mitigation measures and conditions, project actions are not likely to adversely affect ESA-listed species or their designated critical habitat. The following timeline describes the project's consultation history and development.

1994 DOT&PF initiated preparation of the project Environmental Impact Statement (EIS) with NMFS as a Cooperating Agency. Informal consultation between DOT&PF and NMFS during the preparation of the EIS focused on the potential impacts of the East Lynn Canal Highway (Alternative 2) on the Gran Point SSL critical habitat and the Met Point SSL haulout.

1997 DOT&PF released a Draft EIS to the public.

1998 DOT&PF and FHWA submitted a letter-style BA to NMFS on August 13, 1998, that concluded: "….we do not believe an East Lynn Canal highway would have a long-term effect on Steller sea lions using the Gran Point Critical Habitat Area or the Met Point haulout. We hereby ask for your concurrence" (see Appendix B). NMFS concurred with the BA that the East Lynn Canal Highway Project was not likely to adversely affect SSLs or their critical habitat (See 1998 NMFS Letter of Concurrence [LOC], in Appendix B). DOT&PF and FHWA proposed a combination of mitigation and monitoring measures to avoid adverse impacts on SSLs, and NMFS added three additional mitigation measures, including restriction on the creation of boat launches, expansion of year-round monitoring study of SSL use at Gran Point and Met Point, and the requirement to cease work if SSLs are present at Gran Point during construction activities.

2000 In January 2000, then-Governor Knowles announced Alternative 2 — an East Lynn Canal Highway from Echo Cove to Skagway with a Katzehin Ferry Terminal and shuttle ferry to Haines — as the State's preferred alternative. At the same time, the Governor stated that the alternative would not be actively pursued during his administration and that most work on the EIS would be discontinued.

2002 In 2002, then-Governor Murkowski directed that the EIS be completed.

2005 DOT&PF prepared a Supplement Draft EIS for public review with project updates and revised baseline conditions since the 1997 Draft EIS. A revised BA was submitted to NMFS that included analysis of project effect for Alternatives 2 (the original preferred alternative), 2B, and 2C (see Appendix C). Alternative 2 would construct a 68.5-mile-long highway from the end of Glacier Highway at the Echo Cove boat launch area around Berners Bay to Skagway. Alternative 2B was essentially identical to Alternative 2 with the exception that in Alternative 2B the highway would end at the Katzehin River delta. Alternative 2C would extend the highway to Skagway but would not include a ferry terminal in the Katzehin area. These three alternatives would result in similar impacts to SSLs in the same geographic area as addressed in the 1998 BA. The Supplemental Draft EIS was released for public review in January 2005, with Alternative 2, the East Lynn Canal Highway, identified as the State's preferred alternative.

NMFS issued a second LOC reaffirming that Alternatives 2, 2B, and 2C would not adversely affect SSLs, designated critical habitat, or humpback whales (see Appendix C). NMFS indicated their areas of highest concern included the 3,000-foot zone around Gran Point and Met Point haulouts, as well as the long term indirect effects of building a road (within critical habitat) in such close proximity to these remote haulouts. The 2005 NMFS LOC was based on the addition of mitigation measures and conditions the agency proposed related to site specific work plans, monitoring plans, construction sequencing, and restrictions on helicopter use.

2006 FHWA issued a Final EIS and ROD for the project on January and April 2006, respectively. The ROD selected Alternative 2B, the East Lynn Canal Highway, as the preferred alternative to provide improved transportation service between Juneau and Haines/Skagway.

2006 On August 16, 2006, a lawsuit was filed in District Court alleging:

- FHWA violated NEPA by failing to consider reasonable alternatives for improving transportation in Lynn Canal using existing infrastructure without new construction.
- FHWA violated NEPA by relying on inaccurate and misleading frequency delay times in predicting traffic demand and by failing to explain its use in light of evidence in the project record that they were inaccurate. FHWA acted arbitrarily by approving Alternative 2B when the project record shows that the delay times used in the Traffic Demand Forecast were inappropriate and FHWA did not explain its decision to use that data.
- FHWA acted arbitrarily in violation of the Endangered Species Act and Administrative Procedure Act by failing to initiate formal consultation when the proposed road may adversely affect designated critical habitat for Steller sea lions.
- FHWA acted arbitrarily by approving Alternative 2B when its own findings show that operation of the road may result in the taking of bald eagles in violation of the Bald Eagle Protection Act.
- U.S. Forest Service (USFS) violated the National Forest Management Act by approving a right-of-way (ROW) crossing designated Old-Growth Habitat without determining that no feasible alternative existed.

2009 On February 13, 2009, the District Court vacated FHWA's ROD, concluding that the State and the FHWA violated NEPA by failing to consider an alternative for improved ferry service using existing ferries and terminals [Southeast Alaska Conservation Council et al. v. FHWA WL 2988013 (U.S.D. Alaska 2007)]. The Court did not rule on the other claims in the lawsuit, explaining that the plaintiffs could raise other claims with the new NEPA analysis for the project.

2011 A legal challenge to the ROD was appealed to the U.S. Court of Appeals for the Ninth Circuit, which ruled 2 to 1 that the Final EIS was not valid because it did not include an alternative that would improve transportation using existing assets.

2012 FHWA and DOT&PF initiated preparation of another SEIS to include evaluation of an alternative that would improve ferry service using existing AMHS assets. The SEIS would also consider minor route variations of other alternatives due to new information gained from geotechnical investigations, bald eagle nest tree surveys, and permitting requirements since the release of the ROD in 2006. During the SEIS scoping process in early 2012, FHWA and NMFS agreed to reinitiate consultation for ESA-listed species based on new and updated information summarized in Section 1.1 that was not previously considered in the 2005 Revised BA.

2013 FHWA and DOT&PF coordinated with NMFS on new and updated information summarized in Section 1.1 and the potential for formal consultation under the ESA. Based on those conversations, DOT&PF, on behalf of the FHWA, initiated development of this revised BA.

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3. Project Description

Alternative 2B would construct the East Lynn Canal Highway from Echo Cove to a new ferry terminal 2 miles north of the Katzehin River with ferry service connecting Katzehin to Haines and Skagway.

Alternative 2B is viewed in the context of other transportation improvements that are scheduled to occur regardless of Alternative 2B, have independent utility, and are not components of Alternative 2B. These improvements are part of the No Action Alternative in the SEIS and include construction of two Day Boat Alaska Class Ferries (ACFs) to replace the *M/V Malaspina* Lynn Canal summer service in 2016, construction of improved vehicle and passenger staging areas at the Haines Ferry Terminal to optimize traffic flow on and off the Day Boat ACFs, and expansion of the Haines Ferry Terminal to include two new berths.

3.1 Project Elements

Specific Alternative 2B elements include:

- Construction of 47.9 miles of new highway and 2.9 miles of widening of the existing road (50.8-miles total) from Echo Cove around Berners Bay to the Katzehin River.
- Construction of multiple waterbody crossings associated with East Lynn Canal Highway.
- Construction of the new Katzehin Ferry Terminal at the northern end of the new highway.
- Modification of the existing Skagway Ferry Terminal to include a new berth.
- Avalanche blasting associated with maintenance of the East Lynn Canal Highway
- Traffic maintenance and operations along the highway
- Ferry service maintenance and operations
    - Katzehin to Haines
    - Katzehin to Skagway

3.1.1 East Lynn Canal Highway, Alternative 2B

3.1.1.1 Modifications since Issuance of the 2005 NMFS LOC

Alternative 2B would construct the East Lynn Canal Highway along the eastern side of Lynn Canal similar to the original concept described in the 2005 Revised BA (FHWA 2005). Alternative 2B was the preferred alternative of the FHWA's 2006 ROD. Since issuance of the 2005 NMFS LOC, Alternative 2B has been shifted slightly to avoid bald eagle nests and geological hazards. Near the Gran Point haulout, the alignment has been shifted uphill and redesigned to go through two tunnels to avoid a rockfall area and excavation into talus slopes. This alignment modification moves the road farther away from the Gran Point haulout. Near the Met Point haulout, a portion of the road alignment has been shifted 25 to 100 feet closer to Lynn Canal (Table 6-2). However, other portions of the road alignment would remain along the same alignment proposed in the 2005 Revised BA or shift farther landward, away from Lynn Canal. Finally, new and more specific construction-related information is now available for project

elements, primarily those related to highway construction in the vicinity of Gran Point and Met Point.

One notable change since issuance of the 2005 NMFS LOC is the proposed timing of construction relative to the presence of SSLs at both Gran Point and Met Point. The 2006 Final EIS and 2005 Revised BA noted that during highway construction, work within 1,000 feet of the Gran Point and Met Point haulouts would not be conducted when SSLs were present at the haulouts, unless authorized by NMFS. NMFS included this 1,000-foot construction restriction provision in the 2005 NMFS LOC, and further stated that, at Gran Point, no road construction was authorized to occur within 3,000 feet while SSLs were present, unless approved by NMFS. Such construction restrictions were recommended as mitigation tools because pre-2006 camera data revealed periods of time (1- to 5-week blocks) when no SSLs were present. However, video-monitoring data from 2006 through 2011 indicated a nearly year-round presence of SSLs and showed an increase in the number of hauled out animals at Gran Point from late summer through the fall, the time when sea lions were previously thought to be absent. It is therefore no longer feasible to time construction during periods of SSL absence.

To enable project evaluation with respect to effects to listed species, the 2005 NMFS LOC requested more detailed information regarding project-related construction for elements within 3,000 feet of Met Point and Gran Point. Because the highway alignment and design has advanced considerably since issuance of the 2005 NMFS LOC, more details are currently available regarding specific construction actions proposed near Met Point and Gran Point. These details are presented below.

3.1.1.2 Current Gran Point and Met Point Highway Alignment – Activities within 3,000 feet

The current alignment traverses the east side of Lynn Canal within 300 feet of the Met Point haulout and 520 feet of the Gran Point haulout (Appendix D and Sheets EL22 and EL33 of Appendix E). Although Met Point is not designated as critical habitat, it is a frequently utilized haulout in Lynn Canal that may be occupied by SSLs. Therefore, construction in the vicinity of Met Point is described and impacts are assessed in Section 6.

Highway construction near both Gran Point and Met Point would require extensive excavation through rock, using primarily the drill and shoot blasting method. Estimated construction duration rates associated with this method have assumed use of a 20-pound explosive charge per 3-inch drill hole, followed by additional drilling for installation of rock bolts. Multiple blast holes, each filled with 20-pound charges per hole, would be used during rock blasting, resulting in 60 to 80 pounds of explosive per delay. This means that up to four drill holes are each filled with a 20 pound charge. Each of those charges is successively detonated, with a slight delay period between them. The “delay period" means the time interval (generally milliseconds) between successive detonations.

Shot rock excavated from the blasting would require additional processing for use as roadway embankment material. This would be accomplished at crusher sites to be located between the various cut and fill sections of roadway construction to minimize excess hauling and to maximize blasting rates. At this time, crusher sites have not been identified; however,

considering noises associated with crushing operations (see Section 6), they would be sited a minimum of 800 feet from either Gran Point or Met Point.

Specific details on construction approaches for each haulout area are provided below. Impact minimization measures are considered part of the proposed action and are described in detail in Section 7.

Gran Point

Gran Point is located approximately 520 feet west of the proposed roadway centerline at approximately station 2361+00 (see Appendix D). Therefore the 3,000-foot radius of designated critical habitat encompasses the area between approximately stations 2331+00 and 2391+00. The roadway alignment along this 6,000-foot segment consists of a typical 46-foot-wide roadway through cut and fill sections, two tunnel sections, and one bridge section. Excavation would occur via blasting using a drill and shoot method.

Tunnel Sections

From approximately station 2339+50 to 2360+50, the roadway would enter into a full cut section (i.e., entire 46-foot-wide road cross section) as it heads towards the first of two tunnel locations. The first proposed tunnel is 700 feet in length and is located between approximately stations 2363+00 and 2370+00. The second tunnel, approximately 400 feet in length, is located between approximately stations 2378+00 and 2382+00. The brief roadway section between the tunnels transitions quickly from a complete cut at each of the tunnel faces to a full fill section in between. The proposed tunnel cross sections have a total area of 568 square feet.

Tunnel construction would require a working surface, necessitating the use of rock bolts and a shotcrete tunnel liner with anchor bolts along the top half of the tunnel. The tunnel is anticipated to be excavated using explosives with a 20-pound charge, placed into multiple 3-inch-diameter holes placed in rows and blasted simultaneously (60 to 80 pounds per delay), with multiple rows blasted in continuous succession. This would likely yield about 10 feet of excavation per explosive event. Depending on the number of initiation points (i.e., headings) per tunnel (assuming two each), the number of drill rigs (assuming two), and the duration of daily operations, it is estimated that excavation for the 700-foot-long tunnel would require approximately 45 days. Similarly, excavation for the 400-foot-long tunnel would require approximately 30 days (using the same assumptions). The tunnels would be constructed sequentially and thus would take an estimated 75 days total to complete.

There is a paucity of noise data for air blasts associated with the detonation of 20-pound explosives during rock blasting, which is the anticipated charge size to be used for both roadway and tunnel excavation. FHWA (1991) reports typical sound energy levels (air blast over pressure) generated by construction blasting are in the range of 0.007 pounds per square inch, equivalent to 95 A-weighted decibels (dBA) at 665 feet for 50-pound charges. This roughly equates to 124dBA at 50 feet from the source. The Washington State Department of Transportation (WSDOT) reports five blasting noise levels for 18.24-pound and 90-pound charges that average to 126dBA, as measured at 50 feet (Magnoni 2006). For purposes of this document, noise assessments were calculated using the 126dBA (for 18.24-pound and 90-pound charges) blasting noise level, which is approximately 2dB louder than that reported by FHWA (1991) for 50-pound charges.

The 2005 Revised BA (FHWA 2005a) and 2005 NMFS LOC required that no blasting exceeding 45dBA occur within 1,000 feet of either haulout when occupied. Based on updated year-round SSL occurrence data, this condition can no longer be met.

Duration of Activities near Gran Point

Overall, construction of the road alignment within the 3,000-foot designated critical habitat area for Gran Point is anticipated to take approximately 200 workdays, and could possibly be completed in one construction season (April–November). Construction, however, could extend into two and possibly three seasons due to logistical or scheduling delays, or other elements along the alignment that cannot be performed simultaneously with the tunnel excavation.

Helicopter Use

The use of helicopters within 3,000 feet of Gran Point, though not routine, would likely be necessary at times to facilitate delivery of equipment during tunnel construction and associated highway development. Helicopters would not be flown directly over Gran Point.

Screening Structures

Within 3,000 feet of the Gran Point haulout, the East Lynn Canal Highway alignment consists of through-cuts, tunnels, or retaining walls. This road geometry, combined with the extensively vegetated character of the hillside downslope of the roadway, severely impairs the ability to view or physically access the shoreline from the road, and vice versa. As such, the road geometry is visually self-limiting and effectively provides screening to the Gran Point haulout within 3,000 feet. The previous road alignment contained more fill slopes, and therefore would have required visual screening. However, based on the shifted alignment and the associated need for tunneling and retaining features, no screening structures or barriers are proposed in the vicinity of Gran Point.

Vegetation Removal

At Gran Point, the closest portion of the highway alignment is 520 feet from the haulout. Forested buffers would remain between the highway construction footprint and the haulout. Vegetation would be removed from the construction footprint (for the alignment depicted in Appendix D). Due to the extensively vegetated nature of the hillside downslope of the highway alignment in the vicinity of Gran Point, no revegetation of cleared areas within 10 feet of the alignment is proposed following highway construction, except for seeding of exposed soils.

Barge-Landings

Barge landing sites would be used throughout the construction area to deliver construction materials to various locations throughout the alignment. Barges would be towed to sites using tug boats, and would land during high tides, off-load during low tides, and "undock" during the next high-tide cycle. Barge landings at potentially suitable sites have not yet been identified; however, landing sites would be comprised of sandy or gravelly beaches with suitable slope and access to upslope construction areas.

Met Point

Met Point is located approximately 300 feet west of the proposed roadway centerline at about station 1607+54 on the design plans (Appendix D). Although not designated as critical habitat,

for the purposes of impact assessment, activities are described within a 3,000-foot radius of Met Point, between about stations 1577+54 and 1637+54 (Appendix D). The roadway alignment within this 6,000-foot segment consists of the typical 46–foot-wide roadway section through cut-and-fill sections with no tunnels or bridges.

Between approximately stations 1577+54 and 1588+00, and 1610+00 and 1637+54, the alignment contains both cut and fill sections. However, between about stations 1589+00 and 1595+50 (650 feet) and stations 1599+50 and 1610+10 (1,050 feet), the entire roadway lies within a complete cut section with cuts as high as 160 feet, and an average of 100 feet high. Roadway excavation would occur via blasting using a drill and shoot method.

Duration of Activities near Met Point

Given the estimated quantity of material cut for this section (550,000 cubic yards), excavation is estimated to be accomplished in approximately 185 working days. As such, blasting activities in the vicinity of Met Point are anticipated to take place during one construction season (April–November). Construction would likely extend into two and possibly three seasons due to logistical or scheduling delays. Additional activities required within 3,000 feet of Met Point include rock bolting and slope stabilization, hauling of excess material, and retaining wall construction, all of which would occur concurrent with excavation activities.

Helicopter Use

The use of helicopters within 3,000 feet of Met Point, though not routine, would likely be necessary at times to facilitate delivery of equipment during tunnel construction and associated highway development. Helicopters would not be flown directly over Met Point.

Screening Structures

Within 3,000 feet of Met Point, the alignment is comprised of 1.5:1 fill slopes (horizontal distance to vertical distance, or a 33 degree slope angle, or 66 percent grade). Due to the steep nature of proposed fill slopes, the Met Point haulout would be visually observable from the road within 500 feet north and south of the haulout, and the site would potentially be physically accessible. In order to mitigate potential impacts, post-construction screening structures would be provided for a distance of approximately 500 feet north and south of the haulout. Chain link fencing with slats, or similar structures, would be used for light attenuation and to provide physical barriers to pedestrian access.

Vegetation Removal

At Met Point, the highway alignment is 300 feet from the haulout at its closest point. Forested buffers would remain between the highway construction footprint and the haulout. Vegetation would be removed from the construction footprint (for the alignment depicted in Appendix D). Due to the extensively vegetated nature of the hillside downslope of the highway alignment in the vicinity of Met Point, no revegetation of cleared areas within 10 feet of the alignment is proposed following highway construction, except for seeding of exposed soils.

Barge-Landings

Barge landing sites would be used throughout the construction area to deliver construction materials to various locations throughout the alignment. Barges would be towed to sites using tug boats, and would land during high tides, off-load during low tides, and “undock” during the

next high-tide cycle. Barge landings at potentially suitable sites have not yet been identified; however, landing sites would be comprised of sandy or gravelly beaches with suitable slope and access to upslope construction areas.

3.1.2 Waterbody Crossings

The alignment of the East Lynn Canal Highway has not changed from that discussed in the 1998 and 2005 Revised BAs (Table 3-1). The vast majority of bridges would not require in-water piers, and, therefore, no pile driving. Three bridges would require in-water piers, including the crossings of Antler, Berners/Lace and Katzehin rivers. No bridges would be located within 3,000 feet of either Met Point or Gran Point. Refer to Appendix F for typical drawings of bridges.

Table 3-1: East Lynn Canal bridge summary

Bridge No.	Begin Station	Milepost	Total Length (ft)	Intermediate Piers	Stream Name
1E	276+72	44.4	128	0	Sawmill Creek (A)
2E	391+98	46.6	128	0	Boulder Creek (A)
3E	572+17	50.0	144	0	unnamed (A)
4Ea	**641+86**	**51.3**	**2,759**	**19**	**Antler/Gilkey Rivers (A)**
4Eb	671+09	51.9	128	0	Wildlife undercrossing
4Ec	694+48	52.3	118	0	Wildlife undercrossing
4Ed	723+79	52.9	118	0	unnamed
5E	**728+39**	**53.0**	**2,881**	**20**	**Berners/Lace Rivers (A)**
6E	921+15	56.7	288	2	Slate Creek (A)
7E	1306+03	64.0	118	0	Sweeny Creek (A)
8E	1343+71	64.7	60	0	Sherman Creek (A)
9E	1453+18	66.8	144	0	Independence Creek (A)
10E	1561+01	68.8	128	0	unnamed
11E	1669+80	70.9	144	0	unnamed
12E	1677+80	71.1	144	0	unnamed
13E	1681+30	71.2	118	0	unnamed
14E	1703+78	71.6	128	0	unnamed
15E	1735+58	72.2	400	0	NA
16E	1784+50	73.1	300	0	unnamed
17E	1984+00	76.9	160	0	unnamed
18E	2039+52	77.9	300	0	unnamed
19E	2244+80	81.8	160	0	Yeldagalga Creek
20E	2260+80	82.1	128	0	unnamed
21E	2282+00	82.5	128	0	unnamed
22E	2293+37	82.7	128	0	unnamed
23E	2320+84	83.2	150	0	unnamed
24E	2337+93	83.5	144	0	unnamed
25E	2422+39	85.1	128	0	unnamed
26E	2481+03	86.2	128	0	unnamed
27E	2589+53	88.3	128	0	unnamed
28Ea	**2637+65**	**89.2**	**2,590**	**18**	**Katzehin River (A)**

Bridge No.	Begin Station	Milepost	Total Length (ft)	Intermediate Piers	Stream Name
28Eb	2703+45	90.4	128	0	Wildlife undercrossing

A = Anadromous fish stream
Source: DOT&PF. 2013. Juneau Access Project SEIS. 2013 *Update to Appendix D - Technical Alignment Report*.
Note: Those in **bold** require in-water piers.

Since issuance of the 2005 NMFS LOC, there have been two changes to the bridge design and construction approaches, including:

- Increase in span length and piling size for Antler, Berners/Lace and Katzehin river crossings
- Clarification of the need for impact hammers for final proofing of piles and for pile driving if vibratory methods are not successful.

3.1.2.1 Span and Pile Size Modification

In the 2005 Revised BA (FHWA 2005a), the spans were reported to be 130 feet long, and pilings proposed for bridge piers were 24 and 26 inches in diameter placed to a depth of approximately 120 feet. Design modifications and geotechnical analysis have indicated that larger pile sizes are required. As such, the Antler, Berners/Lace, and Katzehin rivers would be crossed with 144-foot spaced spans, each supported by three 48-inch-diameter piles placed to a depth of approximately 120 feet. The exception to this would be the bridge section across the west channel of the Antler River. This channel has the majority of documented eulachon spawning in the crossing vicinity and would be crossed by a longer bridge section to avoid placing piles in the channel.

3.1.2.2 Pile Driving

The majority of in-water work related to construction of the waterbody crossings that require piers has been described in the 2005 Revised BA. As stated in consultation for the 2005 Revised BA, to the extent possible, all piles will be driven with vibratory hammers to reduce the intensity of sound generated. However, since issuance of the 2005 NMFS LOC, further design and construction analysis has clarified the need for impact-proofing of load-bearing structures.

Piles will predominantly be driven using vibratory equipment, but will require impact driving if vibratory methods are not successful and will require impact hammers for final proofing to ensure that piles can bear weight and tensions. Impact minimization measures are considered part of the proposed action and are described in detail in Section 7.

3.1.3 Katzehin Ferry Terminal

Similar to the waterbody crossing element described in Section 3.1.2, the only substantive clarification to the proposed construction at the Katzehin Ferry Terminal since issuance of the 2005 NMFS LOC is the need for impact hammers for final proofing of piles and for pile driving if vibratory methods are not successful. Impact minimization measures are considered part of the proposed action and are described in detail in Section 7.See Appendix F for a plan view of the proposed Katzehin Ferry Terminal.

3.1.4 Skagway Ferry Terminal Upgrades

Similar to the waterbody crossing element described in Section 3.1.2, since issuance of the 2005 NMFS LOC, the only substantive clarification to the proposed Skagway Ferry Terminal upgrades is the need for impact hammers for final proofing of piles and for pile driving if vibratory methods are not successful. Impact minimization measures are considered part of the proposed action and are described in detail in Section 7.See Appendix F for a plan view of the proposed upgrades at the Skagway Ferry Terminal.

3.1.5 Operations and Maintenance

3.1.5.1 Avalanche control on East Lynn Canal Highway

Avalanche control operations would be identical to those previously described in the 2005 Revised BA and consulted on in the subsequent 2005 NMFS LOC. Winter operation would require infrequent (estimated once every 10 years) detonation of unstable snow in an avalanche starting zones within the 3,000-foot radius of the Gran Point and Met Point haulouts. Detonation would be done by helicopter, with the helicopter approach made from the closest point outside the 3,000-foot radius. As stated in the 2005 Revised BA, an unmuffled 50-pound charge typically creates a momentary peak airblast sound level of 95dBA at 665 feet (Konya and Walter 2003); which is roughly equivalent to 124dBA at 50 feet. This type of charge at the avalanche blast location near the haulouts would result in a received sound level of about 73 to 75dBA at the haulouts. Impact minimization measures are considered part of the proposed action and are described in detail in Section 7.

3.1.5.2 Traffic

No changes are proposed from the previously consulted-on project actions as related to the updated traffic analysis. Projected peak traffic noise levels for the year 2050 are 65dBA at centerline of the highway. Normal winter and summer maintenance activities, such as snow removal, sanding, brush cutting, crack sealing, and culvert clean out, would not produce noise levels higher than those predicted from projected traffic.

3.1.5.3 Ferry Service

With Alternative 2B, mainline ferry service would end at Auke Bay and no longer operate in Lynn Canal upon completion of the highway and Katzehin Ferry Terminal. Summer and winter operations are described below.

Summer

- Day Boat ACF-1 would make eight round trips per day between Haines and Katzehin.
- Day Boat ACF-2 would make six round trips per day between Skagway and Katzehin.
- The Haines-Skagway shuttle ferry would make two round trips per day.

Winter

- Day Boat ACF-1 would make six round trips per day between Haines and Katzehin.
- Day Boat ACF-2 would make four round trips per day between Skagway and Katzehin.

- The Haines-Skagway shuttle ferry would not operate. Travelers going between Haines and Skagway would travel to Katzehin and transfer ferries.

3.2 Project Sequencing and Timeline

Alternative 2B is anticipated to be constructed in phases over a period of 6 years from 2014–2020. With some exceptions, upland construction elements would generally take place from April through November. In-water work would take place from June 16 through March 14 of specific construction years to avoid impacts to fish (the protection window for fish is from March 15 through June 15).

Although the upland work period overlaps with peak periods of occupancy at the Gran Point and Met Point haulouts (April through June), specific project elements would be mitigated to minimize impacts at these locations during the spring season (Table 3-2). Note that April through November is the typical construction period, but seasonal and yearly variations may occur.

Table 3-2: Approximate timing of proposed project elements for Alternative 2B

Project Element	Jan	Feb	Mar	Apr	May	June	Jul	Aug	Sep	Oct	Nov	Dec
Upland Elements												
Tunnel and excavation blasting				■	■	■	■	■	■	■	■	
Helicopter use				■	■	■	■	■	■	■	■	
Vegetation Clearing				■	■	■	■	■	■	■	■	
Truck hauling				■	■	■	■	■	■	■	■	
Side-slope protection				■	■	■	■	■	■	■	■	
Retaining wall construction; rock bolts installation				■	■	■	■	■	■	■	■	
In-Water Elements												
Pile driving (bridges and ferry terminals)	■	■	■					■	■	■	■	■	■	■
Dredging (terminals	■	■	■					■	■	■	■	■	■	■
Infrastructure development (ferry terminal fill and riprap)	■	■	■					■	■	■	■	■	■	■
Operations and Maintenance												
Avalanche Control			■	■	■	■						
Ferry Service	■	■	■	■	■	■	■	■	■	■	■	■
Highway Traffic	■	■	■	■	■	■	■	■	■	■	■	■

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4. Environmental Baseline

The action area is defined as the area potentially affected directly or indirectly by a federal action (50 CFR §402.02). The action area for Alternative 2B essentially remains the same as per previous Section 7 ESA consultations. Marine mammals use the action area year-round, with peaks in abundance during spring and summer. Commonly observed species include Steller sea lions, humpbacks, harbor seals, Dall's porpoises, harbor porpoises, Pacific white-sided dolphins, and killer whales. Descriptions of the environmental baseline are hereby incorporated by reference and include the following documents related to Alternative 2B and/or the project action area (list is not all-inclusive):

- *2013 Update to Appendix N: Essential Fish Habitat Assessment*. Juneau Access Improvements Project Draft Supplemental Environmental Impact Statement. State Project Number 71100, Federal Project Number STP-000S (131). 2013.
- *2013 Update to Appendix S – Draft Steller Sea Lion Technical Report*. Juneau Access Improvements Project Draft Supplemental Environmental Impact Statement. State Project Number 71100, Federal Project Number STP-000S (131). 2013.
- *Juneau Access Improvements Project, Threatened and Endangered Species Revised Biological Assessment* (FHWA 2005a) and 2005 NMFS LOC.
- *Appendix W – Technical Report Addenda*. Juneau Access Improvements Project Final Environmental Impact Statement. State Project Number 71100, Federal Project Number STP-000S (131). 2006.
- *Juneau Access Improvements Supplemental Draft Environmental Impact Statement,* Chapters 3 and 4. State Project Number 71100, Federal Project Number STP-000S (131). 2013.
- Endangered Species Act Section 7 Consultation – Biological Opinion for the Kensington Gold Project Operations. 2005 (NMFS 2005).

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5. ESA-Listed Species in Action Area

5.1 Steller Sea Lions (wDPS)

5.1.1 Status of Species

SSLs in Alaska are divided into two DPSs, western and eastern, based on demographic and genetic differences (62 FR 30772). The two DPSs are separated geographically by a dividing line near Cape Suckling, approximately 50 miles southeast of Cordova, Alaska. The wDPS is listed as endangered under the ESA.

5.1.1.1 Western DPS

Steller sea lions that inhabit Lynn Canal are part of the eDPS, but branded individuals from the wDPS have been spotted in the project area, including hauled out at Gran Point where DOT&PF has a video-monitoring system.

Allen and Angliss (2012) reported that the total number of wDPS SSLs throughout their range was approximately 58,000 to 72,000 individuals. Between 2000 and 2011, NMFS estimated that the number of wDPS SSLs in Alaska increased in abundance from 42,500 to 52,200 individuals (Fritz, personal communication, 2013). NMFS estimates that approximately 2 to 3 percent of individuals from the wDPS have been branded (1,222 of 47,350). This number considers the total population size and assumes that, on average, only half of the branded pups are currently extant (Fritz, personal communication, 2013).

Occurrence in Lynn Canal

Observation Data

SSLs that inhabit Lynn Canal are overwhelmingly part of the eDPS, but branded individuals from the wDPS have been spotted in the action area, including hauled out at Gran Point, where DOT&PF operates a video camera monitoring system. To date, only a handful of branded animals from the wDPS have been sighted at Gran Point; no video system is present at Met Point. Nevertheless, the observations of branded individuals demonstrate that there is a degree of crossover between the two populations in the action area. Branded wDPS SSLs also have been observed at Benjamin Island, and Little Island in Lynn Canal, near Berners Bay.

The Alaska Department of Fish and Game (ADF&G) has documented 88 branded wDPS SSLs in the eastern region of Alaska, of which 40 percent were female. It is estimated that nine of these animals gave birth at rookeries in the eastern region, and data suggest that five out of these nine females have permanently immigrated to the eastern region (Jemison et al. 2013). In Lynn Canal, ADF&G documented wDPS SSLs during standard brand-resight surveys conducted from a skiff off the Gran Point and Benjamin Island haulouts. These observations were confirmed by comparing photos taken during the surveys with photos in ADF&G's database (Jemison, personal communication 2013). The first wDPS SSL documented near the action area occurred in 2003 at Benjamin Island in southern Lynn Canal. Two additional animals have been observed at Benjamin Island in 2005 and 2006. Three individual wDPS SSLs have been observed by ADF&G repeatedly at Gran Point from 2003 through 2012. To date, there have been no branded wDPS SSLs documented at Met Point (Jemison, personal communication 2013).

In addition to the Gran Point and Met Point haulouts, SSLs (not specifically wDPS) have been observed to haul out year-round on a small, offshore rock on the eastern shore of the mouth of Slate Creek Cove, near Cove Point; and at Point St. Mary in Berners Bay. There is little information on the use of these haulout sites, although juveniles and adults have been observed at those sites during the peak of eulachon (*Thaleichthys pacificus*) and herring (*Clupea pallasii*) spawning in April and May. Slate Cove has had many observations of SSLs hauled out (NMFS 2005). However, as of 2005, no branded wDPS individuals had been identified in Berners Bay, and evidence suggests that animals using Berners Bay are from the eDPS (NMFS 2005). There are no documented SSL haulouts on the Katzehin Flats, although SSLs forage in this area.

Population Estimates

Regardless of the low frequency of branded wDPS sightings in Lynn Canal, it is likely that unbranded individuals from the wDPS visit Lynn Canal, with peak occurrence during the spring forage fish migration period (April–June) and into the breeding season (May–July). While NMFS does not have specific quantitative data relative to the number of wDPS individuals that may annually occur in Lynn Canal, they have estimated the frequency of visitations to Southeast Alaska. Based on the transition probabilities and estimates of age-specific abundance, NMFS estimates that approximately 900 wDPS SSLs "transition" to Southeast Alaska during the breeding season, on average, each year (based on abundance in 2009). This does not mean that they have permanently immigrated to Southeast Alaska; it is only an estimate of the number that crossed the boundary at least once during an average year (Fritz, personal communication 2013).

As discussed above, since 2000, a total of six wDPS branded animals have been observed on haulouts in Lynn Canal. All of these were branded as pups; three were born on Seal Rocks near Prince William Sound, two on Marmot Island (near Kodiak), and one on Sugarloaf Island (part of the Barren Islands group at the mouth of Cook Inlet). Because these wDPS individuals have been observed using haulouts in Lynn Canal, it is likely that other unbranded wDPS SSLs visit Lynn Canal. It is also likely that the origin of the wDPS migrants is the eastern portion of the wDPS, between Kodiak and Prince William Sound (Fritz, personal communication 2013).

The 6 branded wDPS individuals that have been observed on haulouts in Lynn Canal since 2000 likely represent only a portion of the wDPS individuals that occur in the area at any time. There are likely more animals that transition to the area seasonally given the estimate of branding frequency for the population (2 to 3 percent), recent observations of a J-branded individual (wDPS brand) at Gran Point by DOT&PF, and the lack of 24-hour/365-day monitoring with the specific objective to identify branded individuals. Although video monitoring has occurred for many years at Gran Point, the main objective of monitoring was to determine SSL presence at any specific point during the day. If an SSL was observed, presence was documented for the day, and no further monitoring was conducted for that day. As such, comprehensive monitoring for branded individuals was not the objective of monitoring.

Based on existing recorded data, and assuming that 0.5 branded wDPS per year have occurred in Lynn Canal since 2000, and that 2 to 3 percent of SSLs from the wDPS have been branded, it is possible that 17 to 25 individuals from the wDPS may occur annually in Lynn Canal (0.5 represents 3 percent of 17; 0.5 represents 2 percent of 25). Of the individuals that may annually occur in Lynn Canal, based on recorded observations at Gran Point, approximately one half might occur at that location throughout the year; the other half is expected to occur at Benjamin

Island, south of the action area. As such, 9 to 13 individuals from the wDPS per year (with peaks in spring during the eulachon and herring runs) are estimated occur in the action area, which includes Gran Point, Met Point, Berners Bay (foraging), and marine waters surrounding the proposed Katzehin Ferry Terminal location. A few animals may also be assumed present during the peak foraging season at the Skagway Terminal location.

Alternately, if it is assumed that recorded branded observations have been underestimated and that up to one branded wDPS individual per year has occurred in Lynn Canal since 2000, and that 2 to 3 percent of SSLs from the wDPS have been branded, it is possible that 33 (1/33 represents 3 percent) to 50 (1/50 represents 2 percent) individuals from the wDPS may occur annually in Lynn Canal. Of those, based on recorded observations at Gran Point, approximately one half might occur at that location throughout the year. Therefore, based on a 2 percent branding frequency, an estimate of 25 individuals from the wDPS per year (with peaks in spring following the eulachon and herring runs) could occur at Gran Point annually. It is therefore conservatively assumed that up to 25 individuals could also be present at Met Point annually.

Feeding Behavior

SSLs feed on seasonally abundant prey throughout the year, predominately on species that aggregate in schools or for spawning. Principal prey species include walleye pollock (*Theragra chalcogramma*), Atka mackerel (*Pleurogrammus monopterygius*), Pacific salmon (*Oncorhynchus* sp.), Pacific cod (*Gadus macrocephalus*), flatfishes, rockfishes, Pacific herring (*Clupea harengus*), sand lance, skates, squid, and octopus (Calkins 1998; Sinclair and Zeppelin 2002; Trites and Donnelly 2003; Womble and Sigler 2006; Womble et al. 2009). Capelin (*Mallotus villosus*), herring, and eulachon were three of the most frequently occurring prey species in SSL scat samples from Gran Point during the springs of 2001 through 2003 (Womble et al. 2009).

Spawning eulachon and Pacific herring in Berners Bay provide the dominant prey base for 7 to 10 percent of the Southeast Alaska SSL population for about 3 weeks between April and May (Sigler et al. 2004; Marston et al. 2002; Womble et al. 2005, 2009). The spring eulachon run in Berners Bay is an energy-rich food source for SSLs. Sea lions feeding on this species for 3 weeks may increase their energy intake by 91 percent compared to a normal diet. The energy-rich food source is an important seasonal energy source for all sea lions, especially for lactating females that require more energy to support lactation (Kastelein and Weltz 1990; Sigler et al. 2004). Eulachon arrive in the Berners Bay area usually in late April and early May (Harris et al. 2005). SSLs are most vulnerable to human disturbance during the relatively short period in late April and early May when pre-spawning aggregations of eulachon are present in Berners Bay (Blejwas and Mathews 2005).

5.2 Steller Sea Lion Critical Habitat (Gran Point)

On August 27, 1993, NMFS designated critical habitat for the threatened eastern and endangered western populations of SSLs (58 FR 45269; 50 CFR §226.202). Haulouts with more than 200 animals on average, and all rookeries (breeding areas), were designated as critical habitat. Designated critical habitat typically contains primary constituent elements (PCEs) that make the habitat essential for conservation of the species. In the case of SSL critical habitat, PCEs were not identified specifically as such; the designation was based on the terrestrial and aquatic needs

of the species. The essential physical and biological features of critical habitat include those that support reproduction, foraging, resting, and refuge for SSLs including terrestrial habitats used as haulouts, aquatic habitats that include nearshore waters around haulouts, communal rafting sites, food resources, and foraging habitats (NMFS 1994).

In the Alternative 2B action area, only one site, Gran Point (59°08.0' N latitude, 135° 14.5' W longitude), is designated as critical habitat. Gran Point is located 5 miles south of the Katzehin River and is designated as a major SSL haulout in Alaska. The critical habitat designation includes all the land, air, and water within a 3,000-foot radius of the listed latitude and longitude.

Designated critical habitat in eastern Alaska (i.e., Gran Point) remains even with the delisting of the eDPS of SSL, because the original designation in 1994 applied to the species as a whole, before the two populations were recognized as DPSs. Consequently, consultation is required to evaluate the effects of a proposed action on Gran Point as critical habitat for the endangered wDPS (Rotterman, personal communication 2012).

5.2.1 Gran Point Haulout Data

5.2.1.1 Background

During preparation of the 1997 JAI Project Draft EIS (DEIS), DOT&PF identified the need to collect data on SSL use of haulouts in the project area—in particular, the Gran Point and Met Point haulouts. The original intent of this monitoring was to determine if there was a time of year that construction could occur when SSLs were absent. Such information could be factored into the construction schedule of JAI Project alternatives to reduce disturbance impacts on SSLs hauled out at Gran Point. Initial efforts consisted of opportunistic sightings by the ADF&G and personnel during reconnaissance work in 1994 and by an AMHS ferry in transit between Juneau and Skagway. In 1998, DOT&PF contracted with Skagway Air to document presence of SSLs in the action area. These observations indicated that SSLs appeared to stop using the haulout in early July and did not return until fall or early winter. Using these data, DOT&PF believed that limiting construction near haulouts to the summer season could avoid impacts to SSLs.

DOT&PF included commitments in the 1997 DEIS to initiate a multi-year monitoring study to quantify the year-round use of Gran Point and Met Point haulouts by SSLs and to confirm the use of a summer construction season to avoid impacts to the species. However, the EIS process was put on hold in 1998, so intensive monitoring did not begin until 2002 when DOT&PF installed a remote-control video camera system at the Gran Point haulout. DOT&PF personnel have recorded the daily presence or absence of SSLs from December 2002 through the present, and cameras were typically maintained through the end of October (data available upon request, primarily counts of individuals from the eDPS).

5.2.1.2 Video Monitoring Results

Observations from the video-monitoring data at Gran Point correspond to population count data from NMFS aerial surveys (Womble et al. 2009). These surveys looked at the seasonal distribution patterns of SSLs in southeastern Alaska, including Gran Point and Met Point. Early data from the video-monitoring system at Gran Point, from the time of its installation in late 2002 through September 2005, aligned with the general trend of the 1998 BA. Data indicated that the Gran Point haulout is used most heavily in the spring, when more than a hundred SSLs

were present at Gran Point on most days. Usage decreased in the early summer when considerably fewer SSLs were present. During late summer, SSLs were actually absent for periods of time (1- to 5-week blocks). Use of Gran Point increased again by early fall, with more than a hundred animals present at each site by mid-September. There were generally fewer animals at Gran Point from December through March.

In general, data collected from 2006 through 2012 revealed haulout patterns similar to that of 2002–2005 data, with some yearly variability in SSL residency and abundance associated with seasonal presence of prey species. However, more recent data indicate a nearly year-round presence of SSLs at Gran Point. In addition, from 2006 through 2012, more animals were present from late summer through early fall compared to the earlier data (2002 through 2005). Video monitoring during winter months was discontinued in 2008, primarily because the cameras were difficult to maintain during winter months, and winter construction for Alternative 2Bin the areas around Met Point and Gran Point would be unlikely.

Gran Point SSL haulout data from 2004–2012 (Table 5-1) indicates abundance is greatest from April through June, with a peak in May. Video-monitoring data do not include information on age or sex; however, pups were rarely observed. One study suggests that adult female SSLs with dependent pups likely return to haulout sites in Lynn Canal (e.g., Benjamin Island, Gran Point, and Met Point) to provision their pups between foraging events in Berners Bay (Sigler et al. 2004).

Table 5-1: Average daily number of Steller sea lions observed at Gran Point (2004 to 2012)

	Number of SSLs Observed								
Month	**2004**	**2005**	**2006**	**2007**	**2008[1]**	**2009**	**2010**	**2011**	**2012**
January	46	33	73	72	no data	no data	no data	no data	no data
February	61	26	78	47	no data	no data	no data	no data	no data
March	83	56	75	85	no data	no data	no data	no data	no data
April	95	111	85	109	120	120	no data	no data	no data
May	105	109	112	119	117	120	no data	120	100
June	106	97	113	118	120	120	110	101	100
July	96	33	74	62	62	75	71	8	67
August	30	0	7	1	5	42	10	1	10
September	91	5	8	6	39	31	28	60	41
October	101	76	58	82	88	79	110	115	62
November	101	93	38	103	110	no data	no data	no data	no data
December	78	57	84	68	no data	no data	no data	no data	no data

Note: The total number of SSLs is likely under-reported in this data set. Daily monitoring ceased if individuals were observed since the objective was to determine daily presence or absence, not to estimate populations. Data should not be used for population estimation. Branded data not provided in dataset; individuals primarily from eDPS.

[1] Beginning in 2008, cameras were operated from May through October only due to difficult winter maintenance and unlikely construction in winter.

5.3 Humpback Whales

5.3.1 Status of Species

Humpback whales were listed as endangered under the Endangered Species Conservation Act on December 2, 1970 (USFWS 1970) and have been listed under the ESA since its implementation in 1973. Humpback whales faced large population declines due to commercial whaling

operations of the early twentieth century. Barlow (2003) estimated the population of humpback whales at approximately 1,200 animals in 1966. The population grew to between 6,000 and 8,000 by the mid-1990s in the North Pacific. The population was growing at an annual rate of 6 to 7 percent during the 1990s. Current threats to humpbacks whales include vessel strikes, spills, climate change, and commercial fishing operations.

The population structure for humpback whales is currently under review by NMFS given the extensive data that was collected between 2004 and 2006 during the Structure of Populations, Level of Abundance, and Status of Humpbacks (SPLASH) project. The abundance estimate for the Central North Pacific stock from the SPALSH project is 20,800. During the SPLASH project, 1,115 individual humpback whales were identified in Southeast Alaska, which results in an estimate of 2,883 to 6,414 whales occurring in the waters off Southeast Alaska and Northern British Columbia (Allen and Angliss 2012). This stock of whales has shown a population increase throughout the range of 5.5 to 6.0 percent per year since the early 1990s (Allen and Angliss 2012).

Large aggregations of humpback whales spend the summer and fall in northern Southeast Alaska, which includes bays and waterways of the Inside Passage, including Chatham Strait, Icy Strait, Stephens Passage, and Lynn Canal. Prey consists of small schooling fish such as herring, sand lance, and young walleye pollock, as well as schools of krill.
Critical habitat has not been designated for humpback whales.

5.3.2 Occurrence in Action Area

Individual humpback whales and small groups have been observed in Lynn Canal, Chilkoot Inlet, and Taiya Inlet throughout the year, and higher numbers are present in the summer and fall. The Juneau whale-watching excursion boats regularly observe a group of 15 to 20 animals in northern Stephens Passage during the summer. Sightings from the Alaska ferry system conducted from 1993 to 1998 indicated humpbacks were presented in Southeast Alaska throughout the year, with an increase during April and May, a peak in August, and a sharp decline by October. During this same study, distribution was reportedly widespread throughout Lynn Canal, and peaked in May and June from the western side of Douglas Island northward to Skagway (Mizroch et al. 1998, as cited in NMFS 2005).

Humpback whales typically enter Berners Bay during April and May. As many as five individuals have been observed feeding in the bay during the spring eulachon run. Although they occur most frequently in the spring, small groups or singletons have also been documented from April through November (NMFS 2005). Surveys conducted in Southeast Alaska between 1991 and 2007 found humpback whales in Lynn Canal and indicated seasonal variability, with the fewest whales present in the spring and more animals present in the summer and fall (Dalheim et al. 2009). Over the 17 year study, the analysis showed a 10.6 percent annual increase in the humpback population in Southeast Alaska (Dalheim et al. 2009).

6. Effects Analysis

6.1 Direct Effects of Project on ESA-Listed Species and Critical Habitat

6.1.1 Steller Sea Lions (wDPS)

Construction of the East Lynn Canal Highway has the potential to impact SSLs of the wDPS, if present, during construction and during subsequent maintenance and operation. Construction activities that could impact SSLs include noise and visual aspects of helicopter surveying, highway excavation and fill activities within 3,000 feet of Gran Point and Met Point haulouts, pile driving associated with bridges and ferry terminals, in-water construction at ferry terminals, dredging, blasting, rock crushing, retaining wall construction, and earth moving. Maintenance and operation activities that could impact SSLs include noise and visual aspects of highway/ferry traffic, pedestrian disturbance due to increased access to haulouts, highway maintenance, and avalanche control.

Previous Section 7 ESA consultations have already assessed the majority of project-related effects to SSLs. In most cases, these effects are summarized by specific project element, below. Project elements that are new or further clarified by construction details for Alternative 2Bthat were not specifically addressed in the 1998 and 2005 NMFS LOC are described below in detail, and include:

- Construction elements within 3,000 feet of Gran Point and Met Point
    - Two new tunnels and associated blasting requirements for construction near Gran Point
    - Further clarification of construction details, including construction equipment, associated with rock blasting (excavation) for cut slopes near Gran Point and Met Point
    - Barge landings (none within 1,000 feet of haulouts)
    - Installation and removal of SSL monitoring devices at the haulouts
- Clarification of final impact-proofing of piles and for pile driving if vibratory methods are not successful for waterbody crossings and for ferry terminal construction.

In addition, impact minimization measures detailed in Section 7 are described as part of the proposed action for the effects analysis in the following sections, as appropriate.

6.1.1.1 East Lynn Canal Highway Construction

Disturbance has been observed to have highly variable effects on hauled-out SSLs, ranging from no reaction to complete departure from the site. As noted by Kucey and Trites (2006), “simple interpretation of disturbance effects can be easily confounded by concurrent natural seasonal changes in behaviors or haulout patterns, or by daily variability in numbers of animals present that can be attributed to weather, tidal cycle stage, and other factors.” The experience or habituation of animals present at haulouts may also influence the level of response to the disturbance (Demarchi 2009).

Response of animals to disturbance may vary both temporally and spatially among groups within an area, and may result in greater avoidance or tolerance of certain areas, depending on the source of the disturbance (Gill et al. 2001). One type of behavioral response to disturbance is for an animal to move away from disturbed areas. This response is typically determined by factors such as quality of the site being occupied, distance and quality of other suitable sites, relative risk of predation, density of competitors, and the investment the individual has made onsite (Gill et al. 2001). Reduced numbers of SSLs using haulout sites following human presence represents a measurable short-term effect of human disturbance (Kucey 2005). Displacement may lead to reductions in productivity or complete site abandonment. As noted by Kucey and Trites (2006), disruptions may affect an entire haulout of SSLs. Short-term human interactions at haulouts may include disruptions of sea lion daily activities and potential redistribution of animals to other sites (Kucey 2005). Long-term human interactions at haulouts may potentially reduce the amount of time sea lions haul out, or interfere with haulout patterns, which could affect life cycles and activities (Kucey 2005). Disturbances at foraging areas can also disrupt feeding activities and may cause animals to leave the area, which could lead to additional energy expenditures.

It should be noted that behavioral modifications are exhibited by SSLs naturally, throughout the year. Kucey (2005) determined that the likelihood of a sea lion remaining on land after hauling out was influenced mostly by season. Animals took longer to settle down in winter/spring months, which might reflect harsher weather conditions, extreme tidal fluctuations, or a redistribution of sea lions within their social order as the breeding season approaches.

Met Point and Gran Point Highway Alignment

Highway construction within 3,000 feet of Gran Point and Met Point would require the use of construction equipment within the terrestrial and aquatic components of designated critical habitat at Gran Point, and within close proximity of Met Point. Blasting activities related to construction of the highway within 3,000 feet of the haulouts could possibly be completed during one season with respect to each haulout. Therefore, unless the construction contractor could simultaneously construct the Met Point and Gran Point sections, the total duration of exposure to construction activities within 3,000 feet of each haulout would likely extend over 2 construction years, and possibly into 3 years. The timing of construction in proximity to these haulouts and approximate timing of SSL presence at the haulouts is depicted in Table 6-1.

Table 6-1: Approximate timing of construction elements near Gran Point and Met Point and Steller sea lion occurrence

Project Element	Jan	Feb	Mar	Apr	May	June	Jul	Aug	Sep	Oct	Nov	Dec
Upland Elements												
Tunnel and excavation blasting												
Helicopter use[a]												
Vegetation clearing												
Truck hauling, rock crushing												
Side-slope protection												
Retaining wall construction; rock bolts installation												
Aquatic Elements[b]												
Temporary barge landings (none within 1,000 feet of haulouts)												
SSL Occurrence at Haulouts												
Gran and Met Point presence[c]												

Represents peak level of use.

Represents moderate level of use.

Represents lower level of use.

[a] The use of helicopters within 3,000 feet of Met Point, though not routine, would likely be necessary at times to facilitate delivery of equipment during tunnel construction and associated highway development. Helicopters would not be flown directly over Met Point or Gran Point; [b]No bridges and associated pile driving would occur within 3,000 feet of Met Point or Gran Point; [c]Based on DOT&PF Video Monitoring of Gran Point 2004-2011; Met Point occurrence assumed similar.

For most construction elements, potential direct effects to individual SSLs and terrestrial areas of designated critical habitat discussed in the 2005 Revised BA could still occur in and along the alignment. However, such effects would occur to a lesser extent because the highway would generally be constructed farther inland from Lynn Canal and farther away from haulout areas used by SSLs than described in 2005. Near the Gran Point haulout, the alignment has been shifted uphill and redesigned to go through two tunnels to avoid a rockfall area and excavation into talus slopes. This alignment modification moves the road farther away from Gran Point haulout: approximately 100 to 600 feet horizontally and 50 to 100 feet vertically, depending on location. Near the Met Point haulout, a portion of the road alignment (roughly 1,500 feet) within the 3,000-foot radius surrounding the Met Point haulout has been shifted 25 to 100 feet closer to Lynn Canal (Table 6-2). However, other portions of the road alignment would remain along the same alignment proposed in the 2005 Revised BA or shift farther landward, away from Lynn Canal. Overall, the road alignment within the 3,000-foot radius shifts slightly away from the Met Point haulout.

Table 6-2. Comparison of 2006 ROD and current road alignments near the Gran Point and Met Point Steller sea lion haulouts

Haulout	Station for New Road Alignment	Horizontal shift from 2006 ROD Road Alignment (feet)	Approximate Distance of Current Road Alignment from Haulout (feet)
Gran Point[1]	2330+00	East 400	3,000
	2335+00	East 250	2,575
	2340+00	East 200	2,100
	2345+00	East 100	1,625
	2350+00	East 100	1,175
	2355+00	East 100	750
	2360+00	East 200	500
	2365+00	East 350	700
	2370+00	East 375	950
	2375+00	East 225	1,325
	2380+00	East 400	1,800
	2385+00	East 375	2,150
	2390+00	East 250	2,600
Met Point	1580+00	West 75	2,600
	1585+00	West 75	2,150
	1590+00	West 100	1,725
	1595+00	0	1,175
	1600+00	East 50	850
	1605+00	West 50	300
	1610+00	East 25	400
	1615+00	0	775
	1620+00	0	1,300
	1625+00	East 25	1,675
	1630+00	East 100	2,250
	1635+00	East 125	2,650

[1]Gran Point is designated as Steller sea lion critical habitat.

Construction-Related Noise

Construction activities would include clearing and grubbing, blasting (described in the next section), and use of heavy equipment, all of which could disturb SSLs via noise and/or ground vibration. While the majority of these construction activities were previously addressed in the 2005 NMFS LOC, the following section provides updated information on the level of noise that construction activities may generate and is a summary of pertinent information presented in the *Noise Analysis Technical Report* (appended to the Supplemental DEIS; FHWA 2005c), which contains descriptions of methodology and noise modeling parameters.

The magnitude of construction noise varies over time because construction activity and power demands on construction equipment are intermittent. Average noise levels (FHWA 2005c) where all pertinent equipment is present and operating at a reference distance of 50 feet are as follows:

- Ground clearing - 84±8dBA
- Excavations (non-blast) - 88±7dBA
- Foundations (rock drill) - 88±8dBA
- Erection of structures - 79±9dBA
- Finishing (i.e., paving) - 84±7dBA

Noise generated by highway construction may affect SSLs hauled out at or swimming near Gran Point and Met Point. The baseline noise levels at these haulouts are relatively quiet with notable sound sources including crashing waves, winter avalanches, planes, and recreational boats. The 2005 Revised BA estimated the background noise level at Gran Point as 47dBA based on recordings at similar locations.

A practical spreading loss model was used to estimate the extent of airborne sound related to construction. The model calculates the distance to background (ambient) noise levels by taking into account the reduction in point source noise levels from spreading of the sound wave as it leaves the source and travels outward, which is termed geometric spreading. The model assumes that noise levels would continue to decrease at a constant rate with distance due to geometric spreading. The standard rate of noise reduction is 6dBA per doubling of distance away from the source (Diehl 1973). For this analysis, however, a noise reduction factor of 7.5dBA was assumed. This includes the standard 6dBA reduction factor plus an additional 1.5dBA to account for "soft" site conditions (e.g., vegetated and soils conditions versus bedrock or "hard" site conditions). The formula for calculating spherical spreading loss is:

$$TL = 20\log r$$

where:

TL = Transmission loss
r = Distance from source to receiver
*Spherical spreading results in a 6dB decrease in sound pressure level per doubling of distance, plus additional 1.5dB reduction for soft site characteristics.

Standard Construction Equipment

Construction equipment does not create loud, instantaneous noise such as blasting, but can cause continuous noise in the 55dBA (pickup truck) to 88dBA (rock drill – foundations) range. Based on the maximum extent of rock drill noise production (88dBA $\pm$ 8dBA), general construction noise of 96dBA at 50 feet would attenuate to the background level of 47dBA within 4,560 feet (0.86 mile).

For airborne noise, NMFS considers noise levels over 100dB Root Mean Square ($_{RMS;}$ unweighted) re: 20 micropascals (μP as harassment for marine mammals (i.e., pinniped disturbance from haulouts). Using the maximum non-blasting construction noise anticipated for this project (96dBA for rock drill), this means that noise would not reach the $100dB_{RMS}$ in-air

harassment threshold for SSLs at the haulouts at any time. While SSLs would not be exposed to noise levels that would exceed the NMFS in-air harassment threshold, they would likely be able to hear some level of construction noise within 1,000 feet of the activity.

There are also seasonal SSL haulout sites at Point Saint Mary, Slate Cove, and Cove Point in Berners Bay. Noise from Alternative 2Bis not likely to be heard above ambient background levels considering the distance between the haulout sites and the proposed highway. Highway noise levels at these seasonal haulouts are not expected to exceed background levels. There are no documented SSL haulouts on the Katzehin Flats, although SSLs have been seen foraging in this area (NMSF 2005).

Rock Crushing Station

Peak levels associated with rock-crushing equipment have been reported at 86.7dBA at 45 feet from the source (LDN Consulting, Inc. 2011). Rock crushing operations would be located at several points along the highway alignment depending on site conditions and contractor staging. Noise from continuous use of a rock-crushing station is expected to attenuate to about 55dB within 800 feet, which is just slightly above ambient conditions (47dB). If the haulout is occupied by vocalizing SSLs, this noise is likely to be imperceptible. However, even if perceptible, this would not likely be a source of disturbance.

Construction-Related Blasting

In-Air Noise

A series of studies have been conducted in Canada to investigate SSL responses to the detonation of high explosives at Canada's Department of National Defence Military Training Area in Whiskey, Quebec (Demarchi 2009, 2010a, 2010b; Demarchi et al. 2012). The nearest haulout used by sea lions was approximately 3,280 feet from the blasting sites (Demarchi et al. 2010a). These studies have shown that the first visible response by a sea lion to a blast was typically the change from a prone or other relaxed position to an alert, head-up posture (Demarchi et al. 2012). Individuals were frequently displaced, moving off the haulout and into the water, by explosive events (Demarchi et al. 2012). These studies have also stated that if one individual rushed towards the water, the others would likely follow. However, SSLs exhibit resilience to disturbance, since they returned to haulouts after blasting (Demarchi et al. 2012). Further, Demarchi et al. (2008) reported that blast noise typically exceeds the threshold level for behavioral responses of pinnipeds to in-air noise, but is below the level of 149dB re: 20 µPa (peak) (unweighted), proposed by Southall et al. (2007) as a threshold for auditory injury. Demarchi et al.'s (2010) findings are consistent with Holst and Greene (2003), who concluded that, despite eliciting behavioral responses, military training exercises in California involving upland target and missile launches only had minor, short-term, and localized effects on pinnipeds, with no long-term negative consequences for the pinniped populations.

As described in Section 3.1.1, blasting would be required for two tunnels near the Gran Point haulout, as well as for excavation required for slope cuts along the highway alignment in the vicinity of Gran Point and Met Point. The closest proximity of the tunnel blasting activities to the Gran Point is approximately 550 feet (northeast of Gran Point); excavation blasting at Met Point would occur within 300 feet of the haulout. Blasting associated with the use of 20-pound charges for tunnel/slope excavation would create loud, instantaneous noise anticipated to be

126dBA at 50 feet, but would likely vary depending on the substrate, charges per delay, and weather conditions. Based on these estimates, with application of a soft-site noise reduction factor of 7.5dBA, resulting noise levels from blasts (126dBA) would attenuate to background noise levels (47dBA) at 72,271 feet (13.6 mi). However, blasting would be characterized by some directivity because the bore hole would direct the force and noise of the blast along a horizontal path (i.e., away from the Lynn Canal). Therefore, blasting noise would likely attenuate to background levels within 2 to 3 miles. Topography to the east would attenuate levels more quickly in that direction.

As previously discussed, NMFS has defined in-air thresholds for disturbance for hauled-out SSLs as 100dB$_{RMS}$ (unweighted) re: 20 µPa. For the purposes of determining the extent of project-related noise relative to the airborne disturbance threshold, WSDOT (2013) indicates that the practical spreading equations and procedures can be used (regardless of dBA or dB$_{RMS}$). Based on the 100dB$_{RMS}$ threshold, blasts approaching 126dBA would attenuate to the threshold within 548 feet from the source. As a conservative measure, an additional 52 feet were applied to the 548-feet zone of blasting effect (126dBA) to create a 600-foot Zone of Influence (ZOI) for in-air noise due to blasting near Met Point and Gran Point. The additional buffer was applied to ensure that in-air noise associated with blasting would attenuate below the in-air disturbance threshold. For this assessment, the ZOI is the area encompassed by all locations where the in-air noise resulting from rock blasting is equal to or exceeds the in-air disturbance threshold for hauled-out pinnipeds (i.e., 100dB$_{RMS}$), plus an additional 50-foot buffer.

The closest portion of the southern tunnel alignment near Gran Point is located approximately 550 feet from the haulout. As such, it is possible that individuals from the wDPS would be subject to in-air noise approximately equivalent to the threshold. However, given the likelihood that the tunnel blast noise would travel horizontally through the bore hole, noise may attenuate more quickly and noises would likely be under the threshold.

Excavation blasts associated with cut slopes within 550 feet of Met Point or Gran Point would likely produce air blasts up to 126dBA. It is therefore possible that hauled-out individuals could temporarily abandon the haulout. The potential for this is more likely at Met Point, since cut slope areas are located within 300 feet of the haulout. To determine construction noise levels at a specific distance, the following equation is used (applies also to dB$_{RMS}$ thresholds, per WSDOT 2013):

$$Lmax = Construction\ Lmax\ at\ 50\ feet - 25 * Log(D/Do)$$
where
$$Construction\ Lmax = 126dBA,\ D=300,\ D_o = 50$$

Considering this distance, use of explosives producing 126dBA noise (at 50 feet) would result in noise of 106.5dB$_{RMS}$ at the Met Point haulout. This would exceed the in-air disturbance threshold of 100dB$_{RMS}$. However, the estimated low occurrence of wDPS in the action area likely limits the exposure of listed individuals to any construction-related noise at the haulouts. Further, branded wDPS SSLs have not been observed at Met Point. Still, the potential for unbranded individuals of the wDPS to be present cannot be discounted.

Blasting activities are not anticipated to result in long-term abandonment of either Met Point or Gran Point as the effects of blasting are short term behavioral responses. SSLs may react to loud or unfamiliar sounds by diving into the water from land or by submerging when they are in the water. Generally, they return to their previous behavior within an hour or so after the disturbance. However, their tolerance for this kind of disturbance would depend on its continuity. SSLs may abandon a haulout for longer periods of time if a disturbance continues (NMFS 2005). Regardless, construction-related noise disturbance would not result in population-level effects to the wDPS of SSLs, particularly because so few of them are anticipated to occur in the action area.

Underwater Noise

In their consultation for the Kensington Gold Mine, NMFS (2005) suggested that underwater noise should be estimated for major construction activities that occur close to the shoreline. While most actions associated with Alternative 2B are far enough from the shore such that they are extremely unlikely to be perceived acoustically in the marine environment, it is possible that the blasting close to Met Point or Gran Point could be perceived by in-water SSLs in the vicinity of the haulouts. While in-air peak noise estimates are provided for blasting elements, underwater noise estimates for near-shore blasting are not available as they are site-specific, based on distance to water, substrate, and other factors. According to NMFS (2005), however, there is a method of converting in-air noise levels to underwater equivalents. To do this, in-air noise levels must be increased 26dB to estimate in-water values. Air and water sound pressures also differ in units of reference pressure; in air, the reference pressure is 20 µPa@1m and in water the reference pressure is 1 µPa@1m.

Although some acoustic specialists (Stadler, personal communication 2009) have cautioned that the direct addition method described above should be used with caution when converting in-air noise to underwater equivalents because there are many variables (e.g., densities, sound speeds) that are not directly equivalent, the following provides an in-air to underwater noise conversion per NMFS (2005). Based on the peak blasting noise anticipated (126dB at 50 feet re 20 µPa@1m), the hypothetical peak underwater noise would be 152dB at 50 feet (re 1µPa@1m). This does not take into account the distance of the blasting activity from the water (approximately 300 feet at Met Point for cut slopes, 550 feet at Gran Point for tunnel blasting), which would further reduce the maximum anticipated underwater noise level. Regardless, consideration of a peak underwater noise level of 152dBA indicates that the peak estimate does not exceed the pinniped underwater disturbance level for continuous impact disturbance ($160dB_{RMS}$), nor does it approach the instantaneous peak injury noise level for impulse noises for pinnipeds ($190dB_{RMS}$).

In summary, while it is possible that in-water SSLs may experience noise (and vibration) associated with peak blasting activities near the shoreline, these actions are unlikely to result in measurable behavioral changes in foraging or permanent abandonment of the haulouts (Mahtab et al. 2004). Further, these effects would be minimized by limiting the loudest blasting events within 600 feet of the haulouts to July through November, following peak usage of haulouts at Gran Point and Met Point. Although blasting activities would continue for 1 or 2 years (possibly up to 3) near the Gran Point and Met Point haulouts, following project construction, only avalanche blasting (producing less noise since blast sites are further away from haulouts,

Appendices C and D) would occur in the action area on a very infrequent basis (once every 10 years, estimated).

Vibration

In addition to sound, blasting is a source of vibration that may cause SSLs to temporarily leave a haulout. Typical sound energy levels (air blast over pressure) generated by construction blasting are in the range of 0.007 pounds per square inch, equivalent to 95dBA at 665 feet for 50-pound charges (FHWA 1991). This roughly equates to 124dBA at 50 feet, and as such, the 126dBA noise level presented above is comparable.

Analysis of potential vibration disturbance from blasting within 3,000 feet of the Gran Point and Met Point haulouts presented in the 1998 and 2005 Revised BAs is still relevant. Preshearing the rock face and using smaller charges can reduce the ground vibrations at the haulouts.

Helicopter Use

In the 2005 NMFS LOC, helicopter use during construction was to be minimized within 3,000 feet of haulouts, and avoided within a 1,000-foot radius of haulouts, when occupied. This was considered a feasible measure, based on earlier visual and video camera monitoring that indicated an absence of SSLs from haulouts in late summer. Based on more recent data collected from 2006 through 2011, SSLs are present at Gran Point year round and it is no longer feasible to completely avoid them during helicopter operations. Helicopters would be used to initiate construction of the pioneer road to place drills for through-cuts, and potentially to deliver construction-related materials.

NMFS (2005) states that noise levels are predicted to be 72dBA directly beneath a helicopter flying at 2,000 feet. This noise level is louder than noise levels produced by a heavy/large helicopter, which, according to the Helicopter Association International (2009), produces noise ranging from 77 to 84dB at 1,000 feet. Based on the data presented above, and the likely need for heavy/large helicopters, if SSLs are present, helicopters within 3,000 feet of Gran Point or Met Point would be flown at a minimum altitude of 1,500 feet (when weather conditions permit), and a minimum distance of 1,000 feet from each haulout. No direct flights over the haulouts would be conducted (see Section 7). Flights at this distance would ensure that noise associated with helicopters would not exceed the in-air disturbance threshold for hauled-out SSLs ($100dB_{RMS}$). This altitude is also consistent with NMFS guidelines for viewing marine mammals from a helicopter, which state to "maintain a 1,500 foot minimum altitude when viewing marine mammals from the air" (NMFS 2012b).

It is common for fixed-wing and rotary-wing aircraft transiting the Lynn Canal corridor to regularly fly over the 3,000-foot air-radii around Met Point and Gran Point, with the highest numbers of aircraft during the May to September tourist season. These activities have not been reported as factors that limit the use of SSL haulouts in the action area, based on the several years of monitoring data collected at Gran Point by DOT&PF.

Screening Structures

Gran Point

As described in Section 3.1.1, within 3,000 feet of the Gran Point haulout, the proposed East Lynn Canal highway alignment consists of through-cuts, tunnels, or talus slope retaining walls. This road geometry, combined with the extensively vegetated character of the hillside downslope of the roadway, severely impairs the view of the shoreline from the proposed road alignment, and vice versa. As such, SSLs are unlikely to be affected by light pollution or increased pedestrian access associated with highway construction or operation. No screening structures are proposed at this location.

Met Point

As further described below in Section 7, within 3,000 feet of Met Point, screening structures/pedestrian barriers would be installed approximately 500 feet north and south of the haulout. One option for such structures includes roadside chain link fencing with slats. This fencing could be used for light attenuation to minimize the impact of light pollution on the few individual SSLs from the wDPS, if any, that may utilize the Met Point haulout. As such, SSLs would not be visible from the road, and would not see vehicles or their headlights on the road within 500 feet north and south of the Met Point haulout. Further, fencing would deter pedestrian access from the roadway to the haulout.

Temporary Barge Landings and In-Water Fill

The 2005 NMFS LOC included a minimization measure that no temporary barge landings would be constructed within 3,000 feet of either haulout. Temporary barge landings would be used occasionally, but would not be permanent features of the project. Because landing sites must be free of rocks (i.e., sandy/cobbly beaches) since barges are beached at high tide and unloaded at low tide, no haulout rocks would be impacted. Individuals that may be foraging or otherwise occupying waters near the barge landing sites (to be determined) could be disturbed during landing activities, which would involve the placement and transfer of construction-related materials for a few hours, typically, between tidal events. Tug boats and associated underwater noise could disturb individual SSLs, causing them to avoid the general area of activity during the landing and "undocking" process; however, potential effects to the wDPS are anticipated to be insignificant.

As stated in Section 7 of this BA, no barge landing sites would occur within 1,000 feet of Met Point or Gran Point. This proposed reduction in the distance for barge landings from the 3,000 feet identified in the 2005 NMFS LOC is intended to accelerate the overall construction schedule within the vicinity of the haulouts. By shortening the distance required for delivery of equipment and materials, the overall duration of construction would be shortened resulting in less overall disturbance near the haulouts. In addition, since the number of wDPS at the haulouts is anticipated to be low, especially as distance from the haulouts increase, the potential effects to the wDPS are anticipated to be insignificant with this reduction in landing distance.

No in-water fill placement would occur within 3,000 feet of Met Point or Gran Point associated with roadway construction.

Installation and Removal of SSL Monitoring Devices at Haulouts

Prior to and following construction within 3,000 feet of Gran Point and Met Point, noise monitoring equipment would be installed to enable monitoring of noise levels at each haulout. In addition, new video cameras would be installed at Gran Point one year prior to construction, replacing existing cameras that are at the end of their operational life. Monitoring equipment would be installed during low occupancy periods at each haulout, to the extent possible.

6.1.1.2 Waterbody Crossings

Actions Previously Considered

Construction of multi-span bridges across the Antler, Berners/Lace, and Katzehin rivers would require placement of support structures in the river channels. In their 2005 NMFS LOC, NMFS concurred that adverse effects to listed marine mammals were unlikely to occur if project-related piles were driven using vibratory hammers, and a trained observer monitored for the presence of marine mammals and halted pile driving if any animals came within 660 feet of the activity. In addition, in accordance with the 2005 NMFS LOC, if vibratory hammers cannot be used, and before other measures are employed, NMFS required that they be provided with a description of why vibratory hammers cannot be used so that they may evaluate those alternative measures. Impacts related to in-water construction associated with waterbody crossings would be similar to those previously described in the 2005 Revised BA (FHWA 2005a) and subsequent 2005 NMFS LOC. These impacts include behavioral modifications (i.e., avoidance of an area, surfacing, vocalization) due to underwater sounds associated with vibratory pile driving, and elevated turbidity associated with pile driving and barge use. In addition, runoff during construction and from the completed highway crossings could potentially contain sediments, heavy metals, salts, organic molecules, ozone, and nutrients. However, none of these components are expected to be sufficiently concentrated to cause direct mortality or disturbance of prey species for SSLs.

Impact Proofing of Piles

As described in Section 3.1.2, bridge piers would be driven using vibratory hammers to the extent possible. However, piles will require impact hammers for final proofing at the final stages of pile driving to ensure that piles can bear weight and tensions.

Potential effects due to vibratory installation of piles and subsequent behavioral responses were previously considered in the 2005 NMFS LOC. The anticipated behavioral response to impact proofing of piles would be similar in nature, though likely more pronounced if individuals entered the ZOI for impulse noises. Behavioral effects could include diving and resurfacing, often with vocalization. Generally, animals return to their previous behavior within an hour or so of a disturbance (Porter 1997); however, they may abandon a site for longer periods depending on the duration of a disturbance activity (NMFS 2005).

As presented in Section 3.1.2.2, in-water pile driving would take place from June 16 through March 14 of the construction year to avoid impacts to fish, particularly eulachon and herring, which are prey species for SSLs. During this period, some SSLs may be present in Berners Bay or near the Katzehin River crossing. Of those, it is possible that a few individuals could be from the wDPS. However, because only 2 to 3 percent of wDPS individuals have been branded since 2000, it is unknown how many individuals annually migrate to and from Lynn Canal from the

wDPS. As further described in Section 7, a trained observer would monitor for the presence of marine mammals. In accordance with the 2005 NMFS LOC, pile driving would be halted if any animals approach within 660 feet of each pile being actively driven. In addition, in accordance with the 2005 NMFS LOC, if vibratory hammers cannot be used, and before other measures are employed, NMFS will be provided with a description of why vibratory hammers cannot be used so that NMFS may evaluate those alternative measures. The potential for encountering an individual from the wDPS during short-term impact proofing is likely discountable, particularly considering that in-water work would occur during relatively lower SSL concentration periods.

Bridge Infrastructure Modifications - Effects to Prey/Migratory Corridors

Alternative 2B would bridge 10 streams that support anadromous fish populations, including the Berners/Lace, Antler, and Katzehin rivers. All bridge crossings except the Berners/Lace, Antler, and Katzehin rivers would avoid in-channel work. Piers for the bridges over the Berners/Lace, Antler, and Katzehin rivers would be approximately 144 feet apart on center (as opposed to 130 feet previously, providing more distance between piers) and would not impede fish movement in these rivers.

The bridges over the Berners/Lace and Antler rivers have been realigned as far upstream as possible in response to conservation recommendations made by NMFS during previous Essential Fish Habitat (EFH) consultations, pursuant to Section 305(b)(4)(A) of the Magnuson-Stevens Act. The direct loss of foraging habitat through highway fill and ferry terminal construction, as well as the modification of some subtidal habitat as a result of dredging, would not substantially affect any fish and invertebrate populations in Lynn Canal. For this reason, minor modifications to the bridge design, including an increase in the piling size to 48 inches and increased span lengths, would not result in additional impact to SSL prey items that were not previously considered during previous ESA Section 7 or EFH consultations.

6.1.1.3 Katzehin Ferry Terminal

With the exception of the clarification that piles will require impact driving if vibratory methods are not successful and will require impact hammers for final proofing at the final stages of pile driving to ensure that piles can bear weight and tensions, all impacts due to construction and operation of the proposed Katzehin Ferry Terminal have been previously considered in the 1998 and 2005 NMFS LOC. Previously consulted-on activities are summarized below, along with an analysis of effects due to impact-proofing of piles.

Dredge and Fill

Placement of fill at the ferry terminl site is not expected to affect mobile SSLs, particularly since this activity is generally done from shore during low tides. As stated in Section 7, dredging would not take place during the March 15 through June 15 time period to avoid impacts to fish, which are a prey species of SSLs.

Impacts associated with temporary increases in turbidity associated with in-water construction at the proposed Katzehin Ferry Terminal would be similar in nature and scope to those previously addressed in the 1998 and 2005 NMFS LOC. Construction of the new terminal would result in a short-term increase in turbidity near the construction sites. This turbidity could impact migrating anadromous and/or resident species located near the Katzehin Ferry Terminal site, which could

impact foraging behaviors of wDPS SSLs in the local vicinity, if present. As stated in Section 7, the commitment to avoid in-water construction from March 15 through June 15 to avoid impacts to fish would also avoid impacts to SSLs in the action area. Considering that ambient turbidity is typically high in this area due to its proximity to the Katzehin River, the overall impact is anticipated to be minor.

Pile Driving

Anticipated effects to SSLs due to use of vibratory hammers would be identical to those previously analyzed in the 2005 Revised BA (FHWA 2005a) and 2005 NMFS LOC. Potential effects associated with impact-proofing of piles that would bear weight would be similar to those described for construction of piers related to waterbody crossings (Section 3.1.2). Impact minimization measures described in that section, as well as in Section 7, would also apply for piles driven at Katzehin Ferry terminal.

6.1.1.4 Skagway Ferry Terminal Upgrades

Effects to SSLs associated with proposed ferry terminal upgrades at the Skagway Ferry Terminal would be similar in nature, though lesser in duration and extent, to those associated with new terminal construction at the proposed Katzehin Ferry Terminal (Section 3.1.3). Impact minimization measures described in that section, as well as in Section 7, would also apply for piles driven at Skagway Terminal.

6.1.1.5 Operations and Maintenance

Avalanche Control on East Lynn Canal Highway

Avalanche control operations were previously consulted on in the 2005 NMFS LOC, and no modifications to such operations are anticipated compared to previous submittals. Ongoing avalanche control related to highway maintenance in the vicinity of the Gran Point and Met Point haulouts is unlikely to produce noise that exceeds the in-air disturbance threshold for hauled-out SSLs at either Gran Point or Met Point, given the distance of blast sites from the haulouts (see Appendix D). Further, the estimated frequency of avalanche control at the chutes located near Gran Point and Met Point (every 10 years or so) would also minimize the potential for exposure for noise associated with this element. Avalanche control operations were previously considered not likely to adversely affect SSLs in the 2005 NMFS LOC.

In summary, the noise from avalanche detonation described in Section 3.1.5 would be detectable by SSLs at both the Gran Point and Met Point haulouts, but would not exceed the in-air disturbance threshold for hauled-out pinnipeds. SSLs may react to the sounds by diving into the water from land or by submerging when they are in the water. They are expected to return to their previous behavior within an hour following terrestrial acoustic and vibratory disturbances. The noise and vibration created by the resulting avalanche would be no different than that associated with naturally occurring avalanches.

Highway Operations

Operation and maintenance of the highway would not result in disturbance of either the Gran Point or Met Point haulout. As described in Section 3.1.5, projected peak traffic noise levels for 2038 are 65dBA within 35 feet of the centerline of the highway. Based on soft site

characteristics, and assuming ambient noise levels from 47 to 52dBA, vehicular traffic should attenuate to ambient levels within 115 to 183 feet. At its closest point, the highway would be approximately 520 feet from the Gran Point haulout and 300 feet from the Met Point haulout. As such, traffic noise would not be audible above the background (ambient) noise levels. Therefore, it is unlikely that hauled-out SSLs at either location would perceive traffic noise.

To further support this contention, URS (2005) utilized the Traffic Noise Model (TNM®) to predict the extent of traffic noise on the Gran Point haulout, when the highway alignment was slightly closer (320 feet) to the haulout. The TNM® modeling effort used the horizontal and vertical profile of the proposed roadway and the existing contour information, and input details including the fact that no portion of the highway would provide a direct line of sight to the haulout area (due to steep cut banks, proposed screening structures, and forested buffer zones). These same facts apply to the new highway alignment, which, at its closest point, has shifted an additional 200 feet from the Gran Point haulout. According to the TNM® modeling, and based on the assumptions above, peak-noise-per hour for Alternative 2B at the Gran Point haulout area was predicted to be less than 30dBA (less than ambient).

Normal winter and summer maintenance activities, such as snow removal, sanding, brush cutting, crack sealing, and culvert clean out, would not produce noise levels higher than those predicted from projected traffic.

Ferry Service

Vessel Strikes

The potential for SSL and ferry collisions is considered minimal and was previously considered in the 1998 and 2005 NMFS LOC. During their formal consultation for the Kensington Gold Project, NMFS (2005) stated, "Although it is possible for a SSL, particularly a young animal, to be harmed by a collision with a vessel (most likely caught by the propeller), they are generally very agile and successful at avoiding such encounters when in the water. Collisions with vessels are not believed to be a significant source of mortality of SSLs." Based on this information and the fact that the few wDPS individuals that may be present in the action area are most likely older (considering that nearby rookeries are part of the eDPS), the potential for adverse effects to individual SSLs from the wDPS due to ferry strikes is considered discountable.

Water Quality Impacts

There is the potential for accidental fuel spills from ferries at terminals and while traveling Lynn Canal routes. To date, no in-water fuel spills have been associated with AMHS operations in Lynn Canal. The effects of a spill would depend on its size and location. Spill prevention and cleanup plans would be in place for shuttle ferry operations to minimize potential impacts from accidental spills.

The ferries that would be used for the project would have sanitary waste holding tanks[1]. A sewage treatment facility with a permitted outfall would be installed at the Katzehin Ferry Terminal. Discharges from the sewage treatment facility would be within permit guidelines. Wastewater would undergo aeration and disinfection with ultraviolet light. The treated wastewater would be discharged to Lynn Canal under permit by the ADEC (Alaska Pollutant

[1] Holding tanks would be pumped out and the waste treated onshore for disposal.

Discharge Elimination System [APDES] permit) and/or Alaska Department of Environmental Conservation (ADEC) (Water Quality Permit) and would meet Alaska-established waste discharge limitations. For this reason, the effluent should not impact fish or crab habitat or affect fish and crab populations in Lynn Canal, including Berners Bay.

Vessel fuel leakage, contaminant spills, and pollutant runoff could impair water quality, particularly in areas where vessel activity is concentrated, which could reduce prey in the area or have direct physiological impacts on SSLs and the aquatic areas of designated critical habitat at Gran Point. However, Alternative 2B would only utilize ferry travel lanes in Lynn Canal during intermittent periods of road closure during the winter. It is estimated that closures would occur only a few times per year. The Katzehin and Skagway ferry vessel travel lanes associated with Alternative 2B are north of Gran Point in Lynn Canal. Therefore, compared to alternatives previously considered in the 2005 NMFS LOC, the potential for water quality impacts due to ferry traffic near Gran Point is actually reduced. All vessels are operated in accordance with Oil Spill Contingency Plans approved by ADEC, and on-ship fuel handling and lubrication and waste disposal is conducted by trained personnel using standard operating procedures. As such, the likelihood of these potential impacts is slight.

Ferry Noise

Impacts to SSLs due to ferry noise were previously considered in the 2005 NMFS LOC. No change in project activities has occurred to modify anticipated impacts from this project element since issuance of the 2005 NMFS LOC.

6.1.2 Steller Sea Lion Critical Habitat (Gran Point)

Gran Point is a major SSL haulout, with large numbers of sea lions using the area throughout most of the year. The terrestrial zone, extending 3,000 feet landward, includes additional rocks used by SSLs. The terrestrial areas used by SSLs extend approximately 30 feet above Lower Low Water. Land above this elevation is generally too steep to be accessed by SSLs, and is covered by dense coniferous vegetation.

With implementation of proposed impact minimization measures described herein (see Section 7), no adverse effects are anticipated to Gran Point during operation of the highway. Views of the highway from the haulout and the potential for pedestrian access would be minimized due to the surrounding topography, road geometry, presence of tunnels, and vegetated buffer of coniferous vegetation. No access sites would be constructed within the 3,000-foot radius, and no in-water fill would be placed within this zone. Therefore, with implementation of these measures, the extent of water access near the haulout would not change.

The design and layout of the East Lynn Canal Highway makes human access to the haulouts difficult as the road layout near the haulouts includes extensive areas of through-cuts and tunnels. These features of the highway alignment, combined with the steep terrain between the highway and the shore, would make human access to the haulout from the highway unlikely. Video monitoring at the haulout would be continued for at least 5 years after project construction to determine if any unauthorized access occurs. Based on this monitoring, the FHWA would consult with NMFS to determine if additional measures are necessary to further deter access from the highway.

During construction, potential effects to designated critical habitat at Gran Point would occur, including blasting of areas within 3,000 feet of the haulout to construct the highway. Current data documenting nearly year-round occupancy of Gran Point indicates that noise associated with construction (in-air and underwater) could make Gran Point less suitable for hauling out during blasting events, particularly during construction of the southern-most portion of the 700-foot tunnel near Station 2363+00 (see Appendices C and D). Vibration resulting from blasting could also create conditions that are unfavorable for some individuals.

No adverse modification of designated critical habitat is anticipated. Although barge landings would be permitted at distances greater than 1,000 feet from Gran Point, no permanent alteration of the shoreline would occur within designated critical habitat. Barge landings would be sited on shorelines with sand or cobble beaches with suitable slope; haulouts are characterized by large boulders. No rocks from the haulout would be used or otherwise affected.

6.1.3 Humpback Whales

The following discussion presents the effects of project-related construction on humpback whales. With the exception of clarification for final impact-proofing of piles and for pile driving if vibratory methods are not successful for waterbody crossings and for ferry terminal construction, anticipated project impacts would be similar to those discussed in the 2005 Revised BA (FHWA 2005a) and 2005 NMFS LOC. Impact minimization measures detailed in Section 7 are described as part of the proposed action for the effects analysis in the following sections, as appropriate.

6.1.3.1 East Lynn Canal Highway Construction

Highway construction adjacent to the waters of the action area, including Lynn Canal and Berners Bay, has limited potential to impact humpback whales. Construction at or near the water would produce underwater sounds from blasting, rock drilling, rock grinding, fill placement, and side casting.

Blasting on land with 20-pound delayed charges would primarily be a source of vibration through the ground (less than 0.1 ips), creating a very small seismic wave at the land water interface. Underwater noise and vibration levels produced by blasting would be identical to those presented for the analysis of impacts to SSLs (Section 6.1.1.2). Based on that analysis, underwater noise attributed to upland blasting along the highway alignment would not exceed the current NMFS-defined injury threshold for impulse noises for whales (180dB$_{RMS}$), nor would it exceed the underwater disturbance threshold for whales (160dB$_{RMS}$). Therefore, no additional impact to whales is anticipated due to blasting associated with roadway construction.

Barge landings and associated tug boat operations would not likely produce underwater noise that exceeds underwater disturbance or injury thresholds.

6.1.3.2 Waterbody Crossings

As described in Section 3.1.2, bridge piers would be driven using vibratory hammers to the extent possible to reduce the intensity of sound generated. In the 2005 NMFS LOC, NMFS concurred that adverse effects to listed marine mammals were unlikely to occur if project-related piles were driven using vibratory hammers and a trained observer monitored for the presence of

marine mammals and halted pile driving if any animals came within 660 feet of the activity. In addition, in accordance with the 2005 NMFS LOC, if vibratory hammers cannot be used, and before other measures are employed, NMFS required submittal of a description of why vibratory hammers cannot be used for NMFS' evaluation (see Section 7). With the exception of the clarification that piles will require impact driving if vibratory methods are not successful and will require impact hammers for final proofing at the final stages of pile driving to ensure that piles can bear weight and tensions, anticipated project impacts would be similar to those discussed in the 2005 Revised BA (FHWA 2005a) and 2005 NMFS LOC.

Pile driving for bridges across the Antler, Berners/Lace, and Katzehin rivers would occur during the in-water work window of June 16–March 14 (to avoid impacts to fish from March 15–June 15). Although there is a greater likelihood of whales being in the general vicinity during the summer work period, overall the potential to impact humpback whales is low due to the shallow depths at the crossings. All bridges would be in the upper intertidal areas with very gradually increasing depths out to open water. Per the 2005 NMFS LOC, a trained observer would monitor for the presence of marine mammals during all pile driving activities and activities would be halted if any animals are within 660 feet of the pile being driven (see Section 7).

6.1.3.3 Katzehin Ferry Terminal

With the exception of impact-proofing of piles, impacts to humpback whales due to construction and operation of the proposed Katzehin Ferry Terminal have been previously considered in the 1998 and 2005 Revised BAs and subsequent 1998 and 2005 NMFS LOC. Previously consulted-on activities are summarized below, and impact-proofing activities are assessed.

Dredge and Fill

Placement of fill at the ferry terminal site is not expected to affect humpback whales, as this activity is generally done from shore during low tides. In-water work would not occur between March 15 through June 15 to coincide with the herring and eulachon runs (see Section 7). Furthermore, dredging is not typically a source of loud noise.

Pile Driving

As presented in Section 3.1.2, in-water pile driving would take place from June 16 through March 14 to avoid impacts to prey species of humpback whales (see Section 7). During this period, some humpbacks may be in the terminal vicinity. In the 2005 NMFS LOC, NMFS concurred that adverse effects to listed marine mammals were unlikely to occur if project-related piles were driven using vibratory hammers and a trained observer monitored for the presence of marine mammals and halted pile driving if any animals came within 660 feet of the activity. In addition, in accordance with the 2005 NMFS LOC, if vibratory hammers cannot be used, and before other measures are employed, NMFS required submittal of a description of why vibratory hammers cannot be used for NMFS' evaluation. With the exception of the clarification that piles will require impact driving if vibratory methods are not successful and will require impact hammers for final proofing at the final stages of pile driving to ensure that piles can bear weight and tensions, anticipated project impacts would be similar to those discussed in the 2005 Revised BA (FHWA 2005a) and 2005 NMFS LOC.

6.1.3.4 Skagway Ferry Terminal Upgrades

Effects to humpback whales associated with proposed ferry terminal upgrades at the Skagway Ferry Terminal would be similar in nature, though lesser in duration and extent, to those associated with new terminal construction at the proposed Katzehin Ferry Terminal (Section 6.1.3.3). Impact minimization measures described in that section, as well as in Section 7, would also apply for piles driven at the Skagway Ferry Terminal.

6.1.3.5 Operations and Maintenance

Avalanche control on East Lynn Canal Highway

Avalanche control operations would produce sound and noise levels similar to those associated with tunnel and rock blasting associated with highway construction and were previously consulted on in the 1998 and 2005 NMFS LOC. Based on the analysis presented in Section 6.1.1.1, underwater noise attributed to land-based blasting should not approach the underwater impulse injury ($180dB_{RMS}$) or disturbance ($160dB_{RMS}$) thresholds for cetaceans. Therefore, while humpbacks may detect noises associated with avalanche control, instantaneous underwater sounds are unlikely to cause measurable behavioral changes to individuals that may be present in the vicinity of avalanche control operations.

Ferry Service

Impacts to humpback whales due to ferry service associated with the JAI Project were previously consulted on in the 1998 and 2005 NMFS LOC. The following text is provided to update the current information related to anticipated ferry traffic in the action area associated with this project. Upon completion of the East Lynn Canal Highway, humpback whales would be exposed to increased vessel traffic associated with shuttle operations from the Katzehin Ferry Terminal. The shuttles would be conventional monohull vessels traveling at a speed of up to 15 knots.

During the summer months, one Day Boat ACF would make eight round-trips per day between Haines and Katzehin, a second Day Boat ACF would make six round-trips per day between Skagway and Katzehin, and the Haines-Skagway shuttle ferry would make two trips per day. During the winter, one Day Boat ACF would make six round-trips per day between Haines and Katzehin, and a second Day Boat ACF would make four round-trips per day between Skagway and Katzehin. The Haines-Skagway shuttle would not operate; travelers going between Haines and Skagway would travel to Katzehin and transfer ferries.

There have been no reported whale collisions involving AMHS vessels in Lynn Canal during the 40 years of past operation. Increasing the number of AMHS vessel trips in the northern end of Lynn Canal is not likely to have an effect on humpback whales in the area.

6.2 Indirect Effects

6.2.1 Steller Sea Lions (wDPS)

6.2.1.1 Indirect Effects due to Increased Human Presence

Potential indirect effects to individual wDPS SSLs associated with Alternative 2Bmight include additional harassment if humans are provided access to the currently remote haulouts from the

newly constructed highway. To minimize the potential for this indirect effect, in areas where there are vegetated gaps in close proximity to haulouts, FHWA and DOT&PF have committed to placing boulders to limit parking access, and to provide chain-link fencing to deter pedestrian access (see Section 7). However, accessible terrain is very limited along the proposed roadway alignment.

6.2.1.2 Effects to Prey Resources

As described in Section 3.1.1.2, the Alternative 2Balignment has been adjusted between Slate Cove and Sherman Point to avoid emergent wetlands, moved approximately 700 feet upstream on the Berners/Lace River to avoid intertidal habitat, and moved farther inland on the Antler River to bypass important eulachon habitat. These realignments reduce the potential for indirect impacts to SSL prey resources in Berners Bay by the construction, operation, and maintenance of the East Lynn Canal Highway as previously described in the 2005 Revised BA (FHWA 2005a).

6.2.2 Steller Sea Lion Critical Habitat (Gran Point)

Construction and operation of the East Lynn Canal is unlikely to result in significant pollution of the designated critical habitat aquatic zone. Best management practices would be detailed in the contractor's Stormwater Pollution Prevention Plan to control sediment discharge and prevent oil discharge. Based on water quality studies of similar roadways with equal or higher traffic levels, runoff into salt water would be within state water quality standards (FHWA 2005d). Alternative 2B has been issued a Section 401 Water Quality Certification. The physical separation between the highway and the shoreline would prevent roadside trash and debris from reaching the aquatic zone, thereby minimizing the effects on critical habitat for SSLs and their prey species.

6.2.3 Humpback Whales

Indirect effects to humpback whales would be similar to those presented for the wDPS of SSLs (Section 6.2.1).

6.3 Interrelated/Interdependent Actions

Interrelated actions are those that are a part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration. There are no interrelated or interdependent actions associated with this project.

6.4 Cumulative Effects

Cumulative effects are effects of future state, local, tribal, or private activities, not involving federal activities that are reasonably certain to occur in the action area where the federal action occurs. Within the action project area, proposed and ongoing development and commercial and recreational use of Lynn Canal are anticipated to continue throughout the life of Alternative 2B. NMFS (2005) identified subsistence harvest of SSLs, public and private roads related to the Kensington Goal Mine and Alternative 2B, development associated with the Echo Cove Master Plan, and development related to the operation and use of a gravel and mine pit (Echo Cove Materials Source) as actions that are reasonably certain to occur in the action area. The Kensington Mine and associated ferry service for employees are now operational and considered part of the baseline.

Any future developments could introduce additional vessel traffic into Berners Bay and Lynn Canal, and have the potential to adversely affect water quality in the action area due to runoff from roads and sedimentation from in-water construction associated with marine-related infrastructure (i.e., pile driving, dredging, and in-water material placement in habitat for prey species). In addition, non-point and septic outfalls may affect aquatic prey species for SSLs.

6.5 Impact Summaries

6.5.1 Steller Sea Lion Impact Summary

The updated project description for Alternative 2B described in Section 3 considers new project elements (e.g., tunnel construction at Gran Point, clarification for impact proofing of piles). In addition, this BA Addendum considers new species occurrence data (i.e., year-round presence of SSLs, including estimates of occurrence for individuals from the wDPS). The new and clarified construction elements and updated SSL occurrence data for Gran Point constitute changes to the project or listed species data that were not previously considered in the 2005 Revised BA (FHWA 2005a) and 2005 NMFS LOC. This new information indicates that there is some potential for adverse effects to individual wDPS due to construction-related exposure in the vicinity of Gran Point and Met Point. Project effects, associated impact mitigation measures (see Section 7), and how the effects have changed since issuance of the 2005 NMFS LOC is presented below (Table 6-3; also see Appendix G).

Table 6-3: Summary of project-related effects on Steller sea lion (wDPS)

Activity: Potential effects	**2014 Impacts minimization measure**	**Change in effect compared to 2005 Revised BA**
Helicopter use: Visual and noise disturbance from helicopters conducting survey work during construction.	Helicopter use during construction would be minimized to extent practicable, and there would be no routine use of helicopters within 3,000 feet of Gran Point or Met Point. If helicopter use is infrequently required within 3,000 feet of the haulouts, a minimum altitude of 1,500 feet would be maintained, to the extent weather allows. Helicopters would not be flown directly over Gran Point or Met Point. Flights at this distance would ensure that noise associated with helicopters would not exceed the in-air disturbance threshold for hauled-out SSLs ($100dB_{RMS}$).	Increase in exposure since haulouts are occupied year-round.
Highway traffic: Vehicular noise associated with traffic near haul-outs.	Uphill alignment shift has moved highway farther from the Gran Point and Met Point haulouts.	Decreased exposure to traffic noise.
Barge landings: Landing sites at intertidal fill sites along the highway corridor may cause visual or underwater/in-air acoustic disturbance to nearby sea lions	No barge landing sites would occur within 1,000 feet of the Gran Point or Met Point haulouts.	Decreased overall exposure near the haulouts due to construction efficiency and reduction in construction duration.
Pile driving: Vibratory pile driving would be utilized to the extent possible to construct the Katzehin ferry terminal, and to upgrade the Skagway terminal and bridges over the Antler, Berners/Lace, and Katzehin rivers. Impact hammers would be required for final proofing of piles and if vibratory methods are not successful.	Pile driving at the Katzehin/Skagway terminals and the bridge crossings over Antler, Berners/Lace, and Katzehin rivers would be done with vibratory hammers, to the extent possible, to reduce the intensity of sound generated. However, final impact proofing of load-bearing piles would be required. In addition, pile driving, including vibratory installation and impact proofing, would not take place during the period from March 15 through June 15 to avoid impacts to fish and coincides with higher concentration months for SSL presence in the action area. Impact proofing would initiate with "soft starts," which includes gradual ramping up of piling power, until full operational power is achieved. NMFS concurred in 2005 that vibratory hammers would not adversely affect marine mammals with the condition that during all pile installation, a trained observer would monitor for the presence of marine mammals and all pile driving would be halted if any marine mammal comes within 660 feet of the activity.	Additional exposure due to final impact proofing of piles.
Dredging: Dredge at the Katzehin terminal may create turbidity that could affect the survival of prey species for SSL, but effects to prey base are not expected to result in decreased SSL survival.	Dredging would not take place during the March 15 through June 15 time period to avoid impacts to fish, which are a prey of SSLs.	No change.

Activity: Potential effects	**2014 Impacts minimization measure**	**Change in effect compared to 2005 Revised BA**
Blasting: Road and tunnel construction would require the use of blasting to form the new roadway. Noise and ground vibrations from blasting may cause SSLs to temporarily abandon haulout sites. Noise levels may exceed the 100dB harassment threshold for blasting activities within 600 feet of each haulout.	At the onset of construction within the 600-foot ZOI feet of Met Point or Gran Point haulouts (whichever comes first), DOT&PF would monitor haulouts during blasting to determine if individuals are abandoning the haulout, and to record noise levels at the haulout for 10 days of blasting. If blasting activities are found to be within the thresholds for noise, monitoring would no longer be conducted.	Increase in potential for exposure due to presence year-round.
Excavation/Construction Equipment: Road construction would result in the loss of upland habitat not used by SSLs. Noise levels from construction equipment are not expected to exceed the 100dB in-air harassment threshold.	Met Point and Gran Point haulouts would be monitored within 3,000 feet during any construction activities that may cause disturbance to individual SSLs (i.e., behavioral modification such as temporary haulout evacuation). Monitoring would include visual observations by marine mammal observers. Marked wDPS individuals would be recorded and observed. However, because not all wDPS individuals are marked, all disturbances would be recorded as a conservative measure.	No change.
Traffic noise: The estimated peak traffic noise level for future traffic volumes is 65dBA at centerline of the highway. Traffic noise is expected to attenuate to ambient conditions before reaching either Met Point or Gran Point. Traffic noise would not be audible above the background noise level at haulouts.	Vegetation clearing limits would extend 10 feet on either side of the slope cut or fill for the roadway. As large a buffer as possible of undisturbed vegetation will be retained between the highway and the Gran Point and Met Point haulouts.	No change.

Activity: Potential effects	**2014 Impacts minimization measure**	**Change in effect compared to 2005 Revised BA**
Avalanche control: Avalanche paths near Gran Point and Met Point are expected to require detonation release with a helicopter-dropped explosive charge at a frequency of approximately once every 10 years. A charge of this size (50 lbs) would create a momentary peak airblast sound level of 95dBA at 665 feet, 84dBA at 1,330 feet, and 73dBA at 2,660 feet if detonated in the air. Typically, explosive charges dropped from a helicopter penetrate the snow a few feet, which muffles the sound of the charge.	Helicopter operations during avalanche control would minimize activity within a 1,000-foot radius around the haulouts.	No change. Although SSL presence is now documented to occur in late summer as compared to the 2005 Revised BA, no avalanche control activities would occur during this time period.
Human disturbance: Construction of the new highway increases the potential for human access to sea lion haulout areas. Increased human access may result in visual disturbance or harm to sea lions.	The portion of the highway within 3,000 feet of Gran Point is geometrically prohibitive of viewing the haulout from the highway. In areas near the Met Point SSL haulout where there are vegetation gaps, boulders/jersey barriers will be placed to limit off-road use by hikers and other recreational users (e.g., ATVs). Construction within 3,000 feet of Met Point would include through-cuts and/or screening structures (500 feet north and south of haulout) as necessary to avoid lines of sight between the highway and the haulouts, and to discourage human access to the haulouts. No parking places would be provided for cars to park and provide pedestrian access to haulouts. Chain-link fencing would be used to prevent hiker access to haulouts where suitable hiking terrain is accessible from roadway. Chain link fencing with slats could also be used for light attenuation; however, such structures would be subject to snow accumulation. To minimize recreational boating activity in the vicinity of the two haulouts, no boat launches or structures that enhance boat access (other than the new ferry terminal north of the Katzehin River and terminal improvements at Skagway) would be constructed. Video monitoring at the Gran Point haulout would continue throughout construction and for 5 years after construction of the project to determine the extent of human access to the haulout and disturbance of SSLs. Met Point would be routinely ground monitored following construction of the project to determine if human access is causing potential disturbances. If adverse impacts are identified, the FHWA would consult with NMFS to determine what additional mitigation measures are necessary.	No change.

6.5.2 Humpback Whale Impact Summary

A summary of the various project-related impacts to humpback whales (Table 6-4) provides the basis of the recommended effect determination (Section 8.2) for the species.

Table 6-4: Summary of project-related effects on humpback whale

Activity: Potential effects	**Minimization measure**	**Effect compared to 2005 Revised BA**
Pile driving: Vibratory pile driving would be utilized to the extent possible to construct the Katzehin ferry terminal, and to upgrade the Skagway terminal and bridges over the Antler, Berners/Lace, and Katzehin rivers. Impact hammers would be required for final proofing of piles and if vibratory methods are not successful. NMFS concurred in 2005 that vibratory hammers would not adversely affect marine mammals with the condition that a trained observer would monitor for the presence of marine mammals and halt pile driving if any animals came within 660 feet of the activity. In addition, in accordance with the 2005 NMFS LOC, if vibratory hammers cannot be used, and before other measures are employed, NMFS required that they be provided with a description of why vibratory hammers cannot be used so that they may evaluate those alternative measures.	Pile driving at the Katzehin/Skagway terminals and the bridge crossings over Antler, Berners/Lace, and Katzehin rivers will be done with vibratory hammers, to the extent possible, to reduce the intensity of sound generated. However, final impact proofing of load-bearing piles would be required. In addition, pile driving, including vibratory installation and impact proofing, would not take place during the period from March 15 through June 15 to avoid impacts to fish. Impact proofing would initiate with "soft starts," which includes gradual ramping up of piling power, until full operational power is achieved. NMFS concurred in the 2005 NMFS LOC that vibratory hammers would not adversely affect marine mammals with the condition that during all pile installation, a trained observer would monitor for the presence of marine mammals and all pile driving would be halted if any marine mammal comes within 660 feet of the activity.	Additional exposure due to final impact proofing of piles.
Dredging: Dredge at the Katzehin terminal may create temporary turbidity that could affect the survival of prey species for humpbacks, but effects to prey base are not expected to result in decreased humpback survival.	Dredging would not take place during the March 15 through June 15 time period to avoid impacts to fish, which are prey of humpback whales.	No change.
Operational vessel traffic: Collisions between vessels and whales in Lynn Canal.	None proposed because collisions with whales are not expected.	No change.

7. Impact Minimization Measures

The 2005 NMFS LOC included impact minimization measures for construction, operation, and maintenance of Alternative 2B. The FHWA has reevaluated impact minimization measures proposed in the 2005 Revised BA and those recommended in the 2005 NMFS LOC to reflect the project changes, year-round occupancy of haulouts, and the delisting of the eDPS of SSLs. Few SSLs from the wDPS would be exposed to project related impacts because wDPS sea lions infrequently occur in Lynn Canal. Regardless, the following measures will be required as part of the project to avoid and minimize project effects on ESA-listed species and critical habitat in the action area. Unless otherwise noted, the following commitments in Table 7-1 are from the 2005 NMFS LOC. Modifications from the 2005 NMFS LOC impact minimization measures are also noted.

Table 7-1: Summary of impact minimization measures from the 2005 NMFS LOC and 2013 Revised BA

2005 NMFS LOC Impact Minimization Measures	2014 Revised BA Impact Minimization Measures	Modifications from the 2005 NMFS LOC Impact Minimization Measures
During construction, helicopters would not operate within 3,000 feet of either haulout if occupied.	Helicopter use during construction would be minimized to extent practicable, and there would be no routine use of helicopters within 3,000 feet of Gran Point or Met Point. If helicopter use is infrequently required within 3,000 feet of the haulouts, a minimum altitude of 1,500 feet would be maintained, to the extent practicable. Helicopters would not be flown directly over Gran Point or Met Point.	The 2005 NMFS LOC measure was predicated upon the fact that there were periods when SSLs were not present at the haulouts. Because SSLs are now documented to be present year-round, and helicopters will occasionally be required during construction, the measure is no longer applicable. However, helicopters will not be flown directly over haulouts.
Helicopter operations during avalanche control will minimize activity within a 3,000-foot radius around the haulouts.	Helicopter operations during avalanche control would minimize activity within a 1,000-foot radius around the haulouts.	Clarified that helicopter activity will be minimized within 1,000 feet during avalanche control.
Pile driving at the Katzehin terminal and the Antler, Berners/Lace, and Katzehin rivers will be done with vibratory hammers to the extent possible.	Pile driving at the Katzehin/Skagway terminals and the bridge crossings over Antler, Berners/Lace, and Katzehin rivers would be done with vibratory hammers, to the extent possible, to reduce the intensity of sound generated. However, final impact proofing of load-bearing piles would be required. In addition, pile driving, including vibratory installation and impact proofing, would not take place during the period from March 15 through June 15 to avoid impacts to fish and coincides with higher concentration months for SSL presence in the action area.	Clarified that impact proofing of weight-bearing piles will be necessary.

2005 NMFS LOC Impact Minimization Measures	2014 Revised BA Impact Minimization Measures	Modifications from the 2005 NMFS LOC Impact Minimization Measures
A trained observer will monitor for the presence of marine mammals and pile driving would be halted if any animals come within 660 feet of the activity.	During all piling installations, a trained observer would monitor for the presence of marine mammals and all pile driving would be halted if any marine mammal comes within 660 feet of the activity.	No changes proposed.
	Impact proofing would initiate with "soft starts," which includes gradual ramping up of piling power, until full operational power is achieved.	Measure added to further reduce potential effects to marine mammals during pile driving.
No boat launches or structures that enhance boat access will be constructed by DOT&PF as part of the East Lynn Canal Highway.	No boat launches or structures that enhance boat access (other than the new ferry terminal north of the Katzehin River and terminal improvements at Skagway) would be constructed.	Minor clarification regarding the proposed ferry terminals and improvements has been added.
As large as possible buffer of undisturbed vegetation will be retained between the highway and the Gran Point and Met Point haulouts.	Vegetation clearing limits would extend 10 feet on either side of the slope cut or fill for the roadway. As large a buffer as possible of undisturbed vegetation would be retained between the highway and the Gran Point and Met Point haulouts.	A 10-foot clearing area from the construction footprint has been identified.
	In areas near the Met Point SSL haulout where there are vegetation gaps, boulders/jersey barriers would be placed to limit off-road use by hikers and other recreational users (e.g., ATVs). No parking places would be provided for cars to park and provide pedestrian access to haulouts. Chain-link fencing would be used to prevent hiker access to haulouts where suitable hiking terrain is accessible from roadway.	Added measure to reduce site access by pedestrians and ATVs to the Met Point haulout after construction.
No temporary barge landings would be constructed within 3,000 feet of either haulout.	No barge landing sites would occur within 1,000 feet of Gran Point or Met Point.	No barge landings are currently proposed to be limited to a distance of 1,000 feet of either haulout.
Any construction within 3,000 feet of Met or Gran Point would include through cuts and screening structures as necessary to avoid lines of sight between the highway and the haulouts, and to discourage human access to the haulouts.	Construction within 3,000 feet of Met Point would include through-cuts and/or screening structures (500 feet north and south of haulout) as necessary to avoid lines of sight between the highway and the haulouts, and to discourage human access to the haulouts. Chain link fencing with slats could be used for light attenuation; however, such structures would be subject to snow accumulation. Due to roadway topography, geometry, and design (i.e., tunnels and fill), no screening structures are proposed within 3,000 feet of Gran Point.	Clarification of site conditions and proposed measures at each haulout is provided.

2005 NMFS LOC Impact Minimization Measures	2014 Revised BA Impact Minimization Measures	Modifications from the 2005 NMFS LOC Impact Minimization Measures
No road construction will occur within 1,000 feet of Met or Gran Point if sea lions are present unless approved by the NMFS. Independent observers will be employed to ensure that no sea lions are present during work within 1,000 feet.		This measure is no longer feasible since SSLs are present at the haulouts year-round. However, the eDPS has been delisted, and the vast majority of SSLs that are likely to occupy the haulouts are from the eDPS. This limits potential project exposure of the endangered wDPS of SSLs.
Met and Gran Point haulouts will be monitored during any construction within 3,000 feet to determine if any disturbance is occurring.	Met Point and Gran Point haulouts would be monitored within 3,000 feet during any construction activities that may cause disturbance to document disturbance of individual SSLs (i.e., behavioral modification such as temporary haulout evacuation). Monitoring would include visual observations by marine mammal observers. Marked wDPS individuals would be recorded and observed. However, because not all wDPS individuals are marked, all disturbances would be recorded as a conservative measure.	Clarified that noise monitoring will be conducted at both haulouts.
Any blasting within 3,000 feet of either haulout, if occupied, will be monitored to document that ground vibrations at the haulout are not greater than 0.05 inches per second, and noise levels are not greater than 45dBA.	Blasts noise was calculated to attenuate to the in-air disturbance threshold for hauled-out SSLs (100dBRMS) within 548 feet of the activity. At the onset of construction within the 600-foot ZOI feet of Met Point or Gran Point haulouts (whichever comes first), DOT&PF would monitor haulouts during blasting to determine if individuals are abandoning the haulout, and to record noise levels at the haulout for 10 days of blasting. If blasting activities are found to be within the thresholds for noise, monitoring will no longer be conducted.	Ground vibration monitoring is no longer proposed. Noise levels will be monitored.
Video monitoring at the Gran Point haulout and aerial/ground monitoring at the Met Point haulout will continue for 3 years after construction to determine the extent of human access to the haulouts and disturbance of sea lions. If adverse impacts are identified, the FHWA will consult with NMFS to determine what additional mitigation measures are necessary.	Video monitoring at the Gran Point haulout would continue throughout construction and for 5 years after construction of the project to determine the extent of human access to the haulout and disturbance of SSLs. Met Point would be routinely ground monitored following construction of the project to determine if human access is causing potential disturbances. If adverse impacts are identified, the FHWA would consult with NMFS to determine what additional mitigation measures are necessary.	Clarified that post-construction video monitoring at Gran Point will continue for a period of 5 years after construction.

2005 NMFS LOC Impact Minimization Measures	2014 Revised BA Impact Minimization Measures	Modifications from the 2005 NMFS LOC Impact Minimization Measures
	Dredging would not take place during the March 15 through June 15 time period to avoid impacts to fish, which are a prey species of SSLs and humpback whales.	Added measure to account for dredging that is expected to occur at the Katzehin Ferry Terminal.

8. Effect Determinations

8.1 Western DPS Steller Sea Lions (wDPS) and Designated Critical Habitat

Based on the analysis presented in the 2005 Revised BA (FHWA 2005a), and consideration of new project actions and effects described above, FHWA anticipates that Alternative 2B*may affect* and is *likely to adversely affect* the wDPS of SSLs, as well as designated critical habitat for the species in the action area. Adverse effects to critical habitat are associated with new construction and occupancy information; operational effects will not be adverse. Although the proposed project is *likely to adversely affect* SSL critical habitat during construction, FHWA concludes that it would not destroy or adversely modify SSL critical habitat at Gran Point.

The delisting of the eDPS SSL population became effective on December 4, 2013. Therefore, because the population is longer listed under the ESA at the commencement of construction of Alternative 2B, no determination of project effect has been made for the eDPS.

8.1.1 Take Estimate (wDPS) for Alternative 2B

Appendix G presents an analytical framework of effects associated with specific project elements. As presented in Appendix G, the only project elements resulting in a *may affect, likely to adversely affect* determination (i.e., reach the level of take) are those related to construction within 3,000 feet of Gran Point or Met Point. The primary impact mechanism, as described in Section 6.1.1.1, is noise and vibration related to blasting for highway construction near Gran Point and Met Point, and potential disturbance at Gran Point during installation and removal of video monitoring equipment. No video monitoring is proposed at Met Point. Noise source levels will be verified and visual monitoring will occur at both haulouts during construction, but these activities will occur in the immediate vicinity of construction activities and not specifically at the haulout locations.

8.1.1.1 Number of wDPS Individuals at Gran Point and Met Point

Based on current occurrence data for transitory individuals of the wDPS in Lynn Canal, it is unknown precisely how many individuals from the wDPS may be present in the vicinity of Gran Point or Met Point. Therefore, it is difficult to estimate the number of individuals from the wDPS that may be subject to harassment (i.e., take) during construction of the highway.

Based on the conservative estimate of wDPS individuals that might be present in the action area during any single year (see Section 5.1.1.1), and assuming an overall branding frequency of 2 percent, it is anticipated that up to 50 individuals from the wDPS could be present in the action area annually (25 at Gran Point, and 25 at Met Point).

8.1.1.2 Description of Exposure Calculation for Take Estimation

FHWA and DOT&PF anticipate requesting Level B take/harassment authorization (Incidental Harassment Authorization (IHA)/Letter of Authorization, LOA) under the MMPA for both the wDPS and eDPS prior to construction in the vicinity of Gran Point and Met Point. Although FHWA and DOT&PF will apply for an IHA/LOA in the future, a theoretical take calculation for the wDPS is provided herein. It is anticipated that FHWA and DOT&PF will apply for an LOA

prior to anticipated construction near Met Point and Gran Point in year 2017 or 2018 (construction timing for this work may change). Based on discussions with NMFS (Wright, personal communication 2013), the take estimate provided in this BA would allow NMFS to issue an Incidental Take Statement (ITS), as part of the Biological Opinion, that is contingent upon issuance of the project LOA. The take estimate provided herein represents an order of magnitude that may be modified pending take calculations in the future IHA/LOA application, since use of the action area by the wDPS may be different in future years and construction provisions may be refined or updated. If the take estimate provided in this BA changes pending new information regarding SSL occurrence in the action area, or pending refinement of construction elements that may result in take, modification of the ITS may be required.

The exposure calculation presented here relies on the best data currently available (see Appendix H) for the wDPS of SSLs in Lynn Canal. The method for calculating potential exposures to harassment, behavioral disturbance, etc. (i.e., take) includes the following assumptions:

1. There are three anticipated mechanisms of take of the wDPS of SSLs that can be attributed to Alternative 2B:
    a. Hauled-out pinnipeds at Met Point and Gran Point within the Zone of Influence (ZOI) will be harassed if exposed to in-air noise greater than the $100dB_{RMS}$ noise threshold. Exceedence of this threshold is likely to occur in the vicinity of Gran Point and Met Point during rock blasting associated with construction of the new roadway and/or tunnels.
    b. Ground vibration caused by blasting may harass sea lions hauled out at Gran Point and Met Point. There is no formal threshold for pinniped disturbance for vibration resulting from blasting and disturbance related to vibration would occur at the same time as in-air noise disturbances. Therefore, it is assumed that take occurring within in-air noise ZOI will encompass any disturbance due to vibration, since rock blasting is the source of both noise and vibration.
    c. Disturbance of individuals at the haulouts during installation and removal of noise monitoring equipment for duration of construction within 3,000 feet of Met Point and Gran Point, and potential disturbance of individuals at the haulouts during installation and removal of video cameras at Gran Point. Although cameras are currently in place, new equipment will be required in the future. Equipment would be installed during low occupancy periods, as practical; however, the potential for disturbance cannot be completely discounted.
2. As presented in Section 3.1.1.2, peak noise associated with rock blasting (126dB) is predicted, based on the practical spreading model, to attenuate to the in-air disturbance threshold for hauled out pinnipeds ($100dB_{RMS}$) approximately 548 feet from the blast source, in all directions. As a conservative measure, an additional 52 feet were applied to create a 600-foot ZOI for in-air noise. The additional buffer was applied to ensure that in-air noise associated with blasting would attenuate below the in-air disturbance threshold. For this assessment, the ZOI is the area encompassed by all locations where the in-air noise resulting from rock blasting is equal to or exceeds the in-air disturbance threshold for hauled out pinnipeds (i.e., $100dB_{RMS}$), plus an additional 50-foot buffer (see figures in Appendix D).

3. Up to 25 individuals from the wDPS could be present at either Met Point or Gran Point on any given day when rock blasting occurs. At this time, construction is expected to be conducted in phases, proceeding from south to north; construction in the vicinity of Met Point would therefore occur first. Note that this condition may change, however, based on future construction scheduling. Of the total estimated population of the wDPS, 25 represents much less than one percent. As described in Section 8.1.1.1, based on an overall assumed wDPS branding rate of 2 percent, up to 50 animals may be present in Lynn Canal annually, based on the observation of one branded individual per year. All 50 animals are highly unlikely to be present at Met Point or Gran Point at any one time because there are other haulouts in Lynn Canal (e.g., Benjamin Island). Therefore, take calculations conservatively assume that up to 25 individuals could be present at either Met Point or Gran Point at any time during the Alternative 2B construction season (April – November).
4. Individual sea lions may be harassed multiple times per day if they are exposed to several blasts in one day. However, take calculations equate a single take per individual per day regardless of whether that individual is harassed multiple times over one day. This daily take approach has been used to estimate marine mammal takes for in-air and underwater noise attributed to projects in California and Washington, and for which NMFS has issued take authorizations (e.g., Naval Facilities Engineering Command Northwest 2013; Naval Facilities Engineering Command 2013). In these assessments, applicants multiplied the daily exposure rate by the number of days of the noise-producing activity to yield the total estimated takes.
5. At Met Point, 1,018 linear feet of roadway were estimated to be within 600 feet from the center point of the haulout. The production rate for blasting for this section of roadway within the ZOI is estimated to be about 32.5 feet per day. Therefore, the total duration of blasting within the ZOI for Met Point is 32 days. This represents the duration during which wDPS SSLs may be exposed to in-air noise that exceeds the in-air disturbance threshold in the ZOI due to blasting. As an added conservation measure, an additional 10-percent construction contingency has been included to account for site-specific delays within the ZOI. Therefore, the total duration of blasting within the Met Point ZOI is currently estimated at approximately 35 days.
6. At Gran Point, the total roadway distance within the 600-foot ZOI is 561 feet, which includes 498 feet of open cut, and 63 feet of tunnel. The production rate for the open cut roadway would be the same as for Met Point (32.5 feet per day), which would equate to roughly 16 days. This must be added to tunneling time. The initial tunnel excavation would occur at a slower rate, 5 feet per day, for the first 50 feet (10 days), followed by an additional day to reach the 600-foot ZOI limit. Therefore, the total duration of blasting within the ZOI for Gran Point is 27 days. As an added conservation measure, an additional 10-percent construction contingency has been included to account for site-specific delays within the ZOI. Therefore, the total duration of blasting within the Gran Point ZOI is currently estimated at approximately 30 days.

Based on the assumptions presented above, the calculation for wDPS exposures to in-air blasts that exceed the in-air disturbance threshold for hauled out pinnipeds ($100dB_{RMS}$) is estimated by:

Exposure estimate = N * X days of rock blasting activity within in-air noise threshold ZOI, where:

N = # of animals (25/haulout)

Met Point exposure estimate = 25 *35 days = 875 estimated potential wDPS SSL takes

Gran Point exposure estimate = 25 * 30 days = 750 estimated potential wDPS SSL takes

To calculate disturbance associated with physical presence of individuals during installation and removal of cameras and noise monitoring devices, it is assumed that equipment would be installed in one day at each haulout, and removed in one day at each haulout. It is also assumed that the maximum estimated number of wDPS individuals may be present at each haulout during these activities. Take estimates for Alternative 2Bare summarized below (Table 8-1).

Table 8-1: Estimated total number of potential exposures (i.e., takes) for hauled out western Steller sea lions during construction of Alternative 2B within 3,000 feet of Met Point and Gran Point

Haulout	Take due to exceedence of in-air noise threshold	Take due to disturbance during installation and removal of video cameras and/or noise monitors at haulouts
Met Point	875	0
Gran Point	750	50
Subtotal	1,625	50
Total (both columns)	1,675	

The number of anticipated takes attributed to exceedence of the in-air disturbance threshold would occur over the duration of the construction period for activities that occur within the 600-foot ZOI at both Met Point and Gran Point. Construction is likely to be accomplished within one or two seasons, but may extend into three seasons depending on construction logistics, scheduling, and site conditions.

8.2 Humpback Whales

Based on the analysis presented in the 2005 Revised BA, and consideration of new project actions described above, FHWA believes that Alternative 2B*may affect,* but is *not likely to adversely affect* humpback whale. This determination is consistent with the 2005 NMFS LOC, and, as such, formal consultation is not requested for the humpback whale. Therefore, the FHWA requests that NMFS concur with the *not likely to adversely affect* determination for humpback whales when conducting formal consultation for the wDPS of SSLs and their designated critical habitat.

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Appendix A
USACE-USFS Letters

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Appendix B
DOT&PF/FHWA 1998 Biological Assessment and NMFS Letter of Concurrence

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Appendix C
DOT&PF/FHWA 2005 Revised Biological Assessment, NMFS Letter of Concurrence, and Response Letter from FHWA

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Appendix D
East Lynn Canal Highway Alignment near Met Point and Gran Point

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Appendix E
2013 Alternative 2B Plan Set

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Appendix F
Typical Design Drawings for Alternative 2B Bridges and Ferry Terminals

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Appendix G
Analytical Framework

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Appendix H

Communications with ADF&G and NMFS Regarding Occurrence of Western DPS of Steller Sea Lions in Lynn Canal

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